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Factors Affecting Sexual Function and Sexual Satisfaction among Females with or without Rectal Cancer or Gynecological Cancer

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Factors Affecting Sexual Function and Sexual Satisfaction among Females with or without Rectal Cancer or Gynecological Cancer

by

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Factors Affecting Sexual Function and Sexual Satisfaction among Females with or without Rectal Cancer or Gynecological Cancer

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This descriptive, comparative, correlational study explored the relationships among demographic characteristics, health histories, disease characteristics, body image, anxiety and depression, sexual relationship power, female sexual function, and sexual satisfaction; examined sexual self-schema as a moderator or mediator on female sexual function and sexual satisfaction; and compared the differences in female sexual function and sexual satisfaction between women with gynecological or rectal cancer and women without any cancer. Fifty-five females with gynecological or rectal cancer in the study group and 72 females without any cancer in the comparison group completed seven structured questionnaires.

For females in the study group, a significant negative relationship existed between time since surgery and anxiety and depression, between the number of cancer treatments and female sexual function, and between performance status and anxiety and depression. In addition, a significant positive relationship existed between performance status and sexual relationship power and between the number of cancer treatments and sexual satisfaction. Further, body image was significantly related to anxiety and depression,

sexual relationship power, sexual self-schema, and sexual satisfaction. The anxiety and depression factor was significantly linked with sexual relationship power, female sexual function, and sexual satisfaction. There was a significant negative relationship between sexual satisfaction and sexual relationship power and between sexual satisfaction and female sexual function. Also, females in the study group reported significantly worse sexual function and sexual satisfaction than females in the comparison group.

A hierarchical multiple regression model accounted for 40% of the variance in female sexual function, and gynecological/rectal cancer, body image, and the interaction between sexual relationship power and sexual self-schema were three significant predictors. After controlling for gynecological/rectal cancer, body image, sexual relationship power, sexual self-schema, and the interaction term between sexual relationship power and sexual self-schema, female sexual function accounted for 17% of the variance in sexual satisfaction. In unsolicited comments, females in the study group described the changes in their sexual lives after surgery and treatments, emphasizing that sexual information should be provided promptly and effectively by health care providers. The study findings led to implications and recommendations for the conceptual framework, nursing practice, research, and education.

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Chapter 1: Introduction

In 2006, cancer was the second-leading cause of death in the United States (Centers for Disease Control and Prevention [CDC], 2009). Treatment is required to reduce morbidity and mortality outcomes from cancer; however, the diagnosis and treatment of cancer influence the physiological, psychological, and sexual dimensions of sexuality, and changes in sexuality decrease patients' quality of life (Tierney, 2008). Sexuality involves body image, sexual response, sexual roles, and sexual relationships (Pelusi, 2006). Further, female sexual function is influenced by not only physical status but also psychological status, relationships, and sociocultural background (Althof et al., 2005; Meeking & Fosbury, 1998). However, sexual issues are often neglected in clinical practice, especially for females, whose sexuality is multidimensional, difficult to quantify objectively, and less visible in sexual response when compared with that of males (Vardi, 2006).

Research related to sexuality for females with breast cancer and gynecological cancer has been well represented in the literature, especially for breast cancer. The breast is an obvious symbol of femininity and is deeply related to women's concept of sexuality (Frank, Dornbush, Webster, & Kolodny, 1978); yet, the uterus, ovaries, vagina, and vulva are the female genital organs that are directly related to femininity, sexuality, and fertility (Bukovic et al., 2008; Molassiotis, Chan, Yam, Chan, & Lam, 2002). Cancers of the breast and the female genital organs have been addressed in the research numerous times. However, equal attention has not been paid to related issues of sexual satisfaction and sexual function in females with rectal cancer even though they underwent pelvic surgical

procedures just as females with gynecological cancer have, despite the fact that these procedures have been demonstrated to cause organic sexual dysfunction (Zippe, Nandipati, Agarwal, & Raina, 2006).

The rectum is not a primary female genital organ, but research has verified that the treatment of rectal cancer influences physical sexual function. Researchers have expressed that many females with rectal cancer suffer sexual dysfunction after surgery, such as reduced ability to achieve orgasm, dyspareunia and decreased lubrication, and psychological dysfunction such as poor body image, lower-quality mental health, and a sense of reduced physical attractiveness (da Silva et al., 2008; Hendren et al., 2005). These changes in physical sexual function and psychological status affect female sexuality, but studies are rarely conducted to explore this phenomenon.

Sexual self-schema has been shown to be an important personal factor that buffers the impact of depressive symptoms on sexual satisfaction (Carpenter, Andersen, Fowler, & Maxwell, 2009). Sexual self-schemas are cognitive generalizations related to sexual aspects of the self that guide sexual behavior, demonstrate sexual experience, and affect the attitude regarding the willingness to search for sexual information (Carpenter et al., 2009; Cyranowski, Aarestad, & Andersen, 1999). Females with positive self-schema tend to have more positive sexual thoughts, feelings, and behaviors than females with negative self-schema (Cyranowski et al., 1999). Moreover, power inequalities are reflected in intimate relationships and sexual behavior in females (Pulerwitz, Gortmaker, & DeJong, 2000), and research has shown that gender power is significantly related to sexual dysfunction (Lau et al., 2006).

Therefore, knowing how the diagnosis, surgery, and related treatment of rectal cancer and gynecological cancer affect females' sexuality; comparing the differences between females diagnosed with rectal or gynecological cancer and those without any cancer; and determining what factors might mediate or moderate the process or account for the outcomes in sexual function and sexual satisfaction are helpful in designing strategies and providing appropriate interventions for preventing and improving impaired female sexual function in the future for these specific populations.

Purpose

The purpose of the study is threefold: (1) to compare the differences in sexual function and sexual satisfaction between females who have had rectal cancer or gynecological cancer and those who have not had any cancer; (2) to investigate the relationships among psychological status (anxiety and depression), body image, sexual relationship power, female sexual function, and sexual satisfaction in females who have had rectal cancer or gynecological cancer and those who have not had any cancer; and (3) to identify the effect of sexual self-schema as a predictor and a moderator/mediator on sexual function and sexual satisfaction.

Significance

The estimated numbers of new diagnoses of rectal cancer and of gynecological cancer (including cervical, ovarian, uterine, vaginal, and vulvar cancer) among U.S. females in 2009 are 17,290 and 80,720, respectively (National Cancer Institute [NCI], 2009). However, the females' 5-year relative cancer survival rate in all sites has increased

from 57.1% in 1975–1977 to 67.7% in 1999–2005 (NCI, 2010). Furthermore, females' 5-year relative survival rates of cancer of the rectum and of the female genital system (including cervix uteri, corpus uteri, uterus, ovary, vagina, vulva, and other parts of the female genital system) for 1999–2005 are 67.5% and 69.7%, respectively (NCI, 2010). Therefore, because of the increasing number of cancer survivors, health care providers need to focus more on issues related to quality of life for patients diagnosed with and treated for cancer. The concept of sexuality is an important dimension of social well-being and quality of life that helps people to develop and maintain interpersonal relationships and affection (Thompson, 2007).

The estimated prevalence of sexual dysfunction in females with rectal cancer varies from 11% to 100% (Ameda et al., 2005; Hendren et al., 2005; Vironen, Kairaluoma, Aalto, & Kellokumpu, 2006). Regarding females with gynecological cancer, 24.5% to 80% of them expressed that their sexual lives had negatively changed after the treatment of cancer (Bodurka & Sun, 2006; Carmack Taylor, Basen-Engquist, Shinn, & Bodurka, 2004; Fasching et al., 2007; Greenwald & McCorkle, 2008). Females who have undergone pelvic surgery, radiotherapy, and chemotherapy might suffer physical and psychological effects on their sexual function, such as vaginal dryness, early menopause, feelings of a loss of femininity, poor body image, anxiety, and depression (Bukovic et al., 2008). Furthermore, the issue of sexual function has been somewhat neglected by professional health care providers and researchers, who seldom discuss or explore sexual issues for females with rectal cancer and gynecological cancer.

In addition to advancing the knowledge related to issues of sexuality among females with rectal cancer and gynecological cancer, another important reason for this study is that sexual self-schema and sexual relationship power are important factors in buffering decreased sexual satisfaction and sexual dysfunction. Females with negative sexual self-schema and low sexual relationship power are potentially at high risk for developing female sexual dysfunction and dissatisfaction compared with females who have positive sexual self-schema and high sexual relationship power. Therefore, health care providers can pay more attention to these populations and provide appropriate strategies before cancer treatments begin in order to prevent or decrease sexual dysfunction and dissatisfaction after the treatments.

Statement of the Problem

Past studies on rectal cancer have focused almost exclusively on physical sexual dysfunction between males and females. However, female sexuality is multidimensional, related to physical, psychological, and social statuses, and females can achieve physical and psychological satisfaction without genital contact (Basson, 2001a). However, few studies explore the effects of psychological and social factors on female sexual function and sexual satisfaction after rectal cancer treatments. Furthermore, females' response rates on the questionnaires related to sexual dysfunction in studies after rectal cancer surgery have historically been low (Guren et al., 2005; Platell, Thompson, & Makin, 2004; Sideris et al., 2005; Vironen et al., 2006), and the number of females with rectal cancer in studies was obviously lower than the number of males (Camilleri-Brennan &

Steele, 2001; Engel et al., 2003; Guren et al., 2005; Gervaz et al., 2008; Krouse et al., 2009; Lange et al., 2009; Vironen et al., 2006). Therefore, the findings of studies related to females with rectal cancer have limitations in the effort to gain a whole-picture view of the changes of sexuality after treatment and in designing intervention strategies to support females with rectal cancer.

In addition, more research studies related to sexuality among females with gynecological cancer have been conducted than studies about females with rectal cancer; however, studies on the sexuality of females with breast cancer far outnumber studies in both of these areas. Furthermore, researchers often tend to explore the differences of sexuality between females with breast cancer and those with gynecological cancer because breasts and female genital organs are obviously and directly associated with female sexuality. Females with rectal cancer undergo pelvic surgery, just as those with gynecological cancer do, and experience effects on their sexual function. Only rare studies have included a group of females with rectal cancer or have compared such a group with a group of females with gynecological cancer to investigate whether they experienced a similar impact on physiological and psychological situations after cancer treatment or whether differences exist between these two groups that health care providers need to consider before providing care.

Theoretical Framework

The background theoretical framework of this study is based on radical feminism and the theory of gender and power, and it refers to two components: the conceptual

framework and the method of inquiry (Creswell, 1998). The conceptual framework includes female sexuality, sexuality in females with rectal cancer, sexuality in females with gynecological cancer, and sexual self-schema. The various perspectives contained in these four concepts are used to guide the development of research questions and methodology. The method of inquiry in this study, which is that of feminist empiricism, is used to address the purposes of the study and the methodology issues, which include the concept of feminism, quantitative method, and the data collection technique.

Radical Feminism

Gender inequality, which indicates a social hierarchy in which men are superior to women, shapes sexuality, and sexuality becomes the dynamic at the core of inequality between men and women (MacKinnon, 2002). Under this premise, women are supposed to prefer heterosexual relationships, and men have illusions concerning women (Rich, 1980). However, men made women into sexual objects (MacKinnon, 2002) to reflect men's sexual needs and so women could be controlled by men (Rich, 1980). MacKinnon (2002) found that "female" could be defined as an adjective, indicating possession of certain qualities, or a noun, indicating biological ascription. Furthermore, women are forced to hide their feelings, strive to adhere to beauty standards and maintain a sexual appearance, inhibit their own sexual needs or concerns, and even fake orgasms in order to protect or consider the needs and feelings of men (Shulman, 1980). Dworkin (1987) also asserted that women became men's property to be owned and to be "fucked" by them. Further, through sexual intercourse, men demonstrate their dominance over not only

women's physical bodies but also their psychological selves (Dworkin , 1987). Therefore, the relationships between men and women became more deep and intimate. Women learned how to meet men's sexual needs and respond to men's dominance to earn love or affection and economic security, even to affirm their femininity and desirability (Dworkin, 1987; Rich, 1980). However, if women had sexual freedom as men do, women could initiate sexual intercourse without shame or social constraints so they could achieve sexual satisfaction and equality (MacKinnon, 2002).

Radical feminism emphasizes gender as a social construct by which people's choices and behaviors are defined and limited based on their biological sex assignment (Chambers, 2005). Furthermore, Oakley (1972) and Densmore (1973) stated that there is a power inequality in sexual relationships between males and females. The norm in sexuality, as well as in other social situations, is that males are dominant and females are submissive (Tong, 1989). Radical feminists expressed that sexuality should be restructured and reconceptualized to attain equality between males and females (Tong, 1989). Further, radical feminism has tried to uncover females' sexual subordination by searching for the nature, extent, and characteristics of environmental oppression (Kreps, 1973; LeMoncheck, 1997). Therefore, power levels in sexual relationships will be a variable in this study to explore the impact of power inequalities on female sexual dysfunction and sexual dissatisfaction.

Moreover, Leiblum (2002) expressed, "If sexual drive was defined less in terms of genital contact and more in terms of sensuality, women would be perceived as being more sensual than men.…The emotional context of physical sex plays a greater role in

women's understanding of their sexual desire" (p. 61). Radical feminism declares that females need to be valued as "agents of their own emancipation" (Chambers, 2005, p. 326) so that their preferences and desires are taken seriously (Chambers, 2005).

Furthermore, gender differences have been revealed in studies related to rectal cancer, such as that females are more concerned about body appearance and physical function and males are more concerned about physical sexual problems (Hendren et al., 2005; Schmidt, Bestmann, Kuchler, Longo, & Kremer, 2005a). Body image, which is related to the feeling of being feminine and attractive, plays an important role in females' sexual self-concept (Cohen, Kahn, & Steeves, 1998; White, 2000), and changes in body image affect female sexual function significantly (Fobair et al., 2006). Therefore, radical feminism theory provides a background and context for exploring the effect of psychological status and body image on female sexual function and sexual satisfaction following surgery for rectal cancer and gynecological cancer, especially because the theory stands on a female-centered view as an alternative to the traditional male-centered view and values females as agents of their own destinies.

The Theory of Gender and Power

The theory of gender and power is a theory of social structure derived from gender inequalities, differences in gender relations, and power imbalances (Connell, 1987). The assumption of the theory that three structures—the division of labor, the division of power, and the structure of social norms and affective attachments—are the major structures of the field of gender relations is based on the fact that they are

omnipresent in current gender research and sexual politics and that they explain most of the structural dynamics currently understood (Connell, 1987). There is no figure for this model to explain the relationships among these three structures directly, but the structures of the division of labor and the division of power can be the objectives of practice of power and labor, and they generally occur with the structure of social norms and affective attachments (Connell, 1987).

The division of labor is "an allocation of particular types of work to particular categories of people" (Connell, 1987, p. 99). There is a social rule that the division of work among people allocates people to work, such as work X being for females and work Y being for males; in addition, the difference in incomes is also a consideration in the issue of gender (Connell, 1987). Regarding the division of power, Connell (1987) says, "The relations of power function as a social structure, as a pattern of constraint on social practice, is in one sense all too obvious" (p. 107), and "If authority is defined as legitimate power, we can say that the main axis of the power structure of gender is the general connection of authority with masculinity" (p. 109). The structure of social norms and affective attachments addresses relationships with emotional attachments (Connell, 1987); for example, females who are economically and socially inferior are prone to prostitution (Connell, 1987). There are two cultural principles by which purposes of desire are defined—namely, the dichotomy of opposition between feminine and masculine and sexual practices occurring within relationships between two individuals (Connell, 1987).

The three structures overlap in practice but have distinct concepts to explain the gender-based inequalities in society, including economic inequalities, males with dominance over females, and social norms and cultural contexts regarding gender roles (Wingood & DiClemente, 1998). The inequalities in sexual relationships have been demonstrated to have an impact on males' and females' sexual health, sexual attitudes, and sexual behaviors (Blanc, 2001; Ketchen, Armistead, & Cook, 2009), and ethnic differences have been shown to predict females' sexual decision-making and sexual behaviors (Soet, Dudley, & Dilorio, 1999). Therefore, personal income and employment status, falling under the category of the division of labor; sexual relationship power in the category of the division of power; and race, ethnicity, marital status, and length of time with the current partner, under the structure of social norms and affective attachments, are variables in this study based on the theory of gender and power to explore the impact on females' sexual function and sexual satisfaction after undergoing treatment for rectal cancer and gynecological cancer.

Conceptual Framework

Female sexuality. Pelusi (2006) indicates that sexuality includes body image, sexual response, sexual roles, and relationships. Masters and Johnson (1966) explained that the human sexual response cycle involves four stages: the excitement stage, the plateau stage, the orgasm stage, and the resolution stage. The basic conception of the model focuses on the physiological changes of genitalia in the first three stages of the sexual response; however, the orgasm stage in females is a psychophysiological

experience and is affected by a psychosocial background (Master & Johnson, 1966). In addition, Hite (1993) supported this view with her finding that 70 percent of women in her study did not achieve orgasm through sexual intercourse. In 1979, Masters and Johnson's sexual response model was refined by Kaplan, who provided a modified one comprising sexual desire, arousal, and orgasm. Unlike the visible nature of males' erections, females' genital arousal is more subtle and intangible (Althof et al., 2005). Clitoral stimulation is necessary for females to achieve orgasm (Hite, 1993). However, Kinsey, Pomeroy, Martin, and Gebhard (1953) explained that female sexual response would be inhibited because females felt disgusted by the appearance of male genitalia. Therefore, Leiblum (1998) expressed that the nongenital element is especially emphasized in females' sexual satisfaction. Sexual response involves social relationships between the sexual partners who respond to each other, and people would be more satisfied with this kind of social relationship than with actual physical sexual behaviors (Kinsey et al., 1953). Further, Basson et al. (2000) pointed out that females can achieve sexual arousal or orgasm but still not be satisfied with their relationships. Female sexual satisfaction is significantly associated with the quality of the relationship (Sprecher, 2002), and females who have stronger intimate relationships experience more successful adjustments after cancer treatments (Wilmoth, 2001).

Sexuality in females with rectal cancer. Pelvic surgery is the main treatment for rectal cancer; however, organic sexual dysfunction caused by damage to the pelvic autonomic nerves is a common consequence in females after rectal surgery (McLeish, 2004; Zippe et al., 2006), as this damage is likely to cause impairment in sexual arousal

and libido (Platell et al., 2004). For people with rectal cancer, common treatments include anterior resection (AR), low anterior resection (LAR), high anterior resection (HAR), and abdominoperineal resection (APR) (Keating, 2004; Salonia et al., 2006; Zippe et al., 2006). Different types of rectal cancer surgery will cause different levels of damage to the pelvic autonomic nerves, resulting in different female sexual dysfunctions, such as dyspareunia; problems related to libido, arousal, lubrication, and orgasm; the vagina becoming too short or less elastic; and the concern of fecal soiling during sexual intercourse (Ameda et al., 2005; Hendren et al., 2005; Platell et al., 2004; Vironen et al., 2006). People who had APR have more sexual dysfunction than those who had LAR or HAR (Vironen et al., 2006). Furthermore, rectal cancer patients with an ostomy experience not only sexual dysfunction after the surgery but also problems related to the ostomy, such as odor, noise, and leakage (Hendren et al., 2005; Manderson, 2005). In addition, Hendren et al. (2005) also pointed out that radiotherapy was independently related to sexual life after the rectal cancer surgery.

Sexuality in females with gynecological cancer. Cancer involving the genitalia affects women in not only physical but also cognitive and psychosocial ways, especially when the uterus, ovaries, vagina, and vulva are disfigured, because they relate to femininity, motherhood, and sexuality (Krant, 1981; Lamb, 1990; Tang, Siu, Lai, & Chung, 1996). Different surgeries and treatments for gynecological cancer induce different levels of sexual dysfunction because of the changes to gonadal function, the vagina, and the pelvic vessels and nerves (Frumovitz et al., 2005; Lamb, 1990; Carmack Taylor et al., 2004). Surgical procedures include hysterectomy, vulvectomy,

oophorectomy, ostomy surgery, and pelvic exenteration (Carmack Taylor et al., 2004; Carter et al., 2004; Lamb, 1990), and treatments include pelvic irradiation with and without vaginal irradiation and chemotherapy (Frumovitz et al., 2005; Lamb, 1990; Weijmar Schultz & Van De Wiel, 2003). Gynecological cancer and its surgical and nonsurgical treatments cause not only physiological sexual dysfunction but also psychosexual problems, including worsened body image, a sense of decreased attractiveness, decreased self-confidence, depression, anxiety, poor self-image, and the feeling of being less feminine, all of which negatively affect sexual function (Bodurka & Sun, 2006; Carmack Taylor et al., 2004; Hawighorst-Knapstein et al., 2004).

Sexual self-schema (sexual self-concept). Sexual self-schema depicts core beliefs that are related to sexuality of the self and that guide a person's information processing of sexuality and future sexual behavior (Cyranowski et al., 1999). Females with a positive schema tend to be emotionally romantic or passionate and behaviorally open to sexual activities and relationships (Anderson & Does, 1994), and these females are also apt to be liberal in sexual attitudes and free from social inhibitions (Andersen & Cyranowski, 1994). On the contrary, females with a negative schema tend to describe themselves as less romantic or emotionally cold and inhibited in their romantic and sexual relationships (Anderson & Does, 1994); furthermore, these females might be conservative and have negative attitudes toward sexual activities, such as embarrassment or self-consciousness (Andersen & Cyranowski, 1994; Anderson, Woods, & Cyranowski, 1994). Therefore, they are apt to be less confident in sexual or social contexts and vulnerable to the outside environment when compared with positive-schema females because a negative-schema

female's self-view is easily moderated or affected by others (Andersen & Cyranowski, 1994; Anderson & Does, 1994).

The Method of Inquiry

Traditionally, research on sexuality has focused on males' sexual response and behavior, thus establishing males' sexuality as the norm (Wood, Koch, & Mansfield, 2006). Females' sexuality is typically pitched in terms of asexuality or passive-recipient sexuality; therefore, females' sexual desire is rarely perceived as spontaneous (Bay-Cheng & Zucker, 2007). A review of the research literature on sexuality in females with rectal cancer and gynecological cancer demonstrates that there is still much to be explored completely and deeply. Therefore, the perspectives that feminist research is "*about* or *for* women" or conducted "*from the perspective of* women" (Rodgers, 2005, p. 162) and should focus on females' experiences and perspectives (Hall & Steven, 1991; Sigsworth, 1995) fit the purpose of this study.

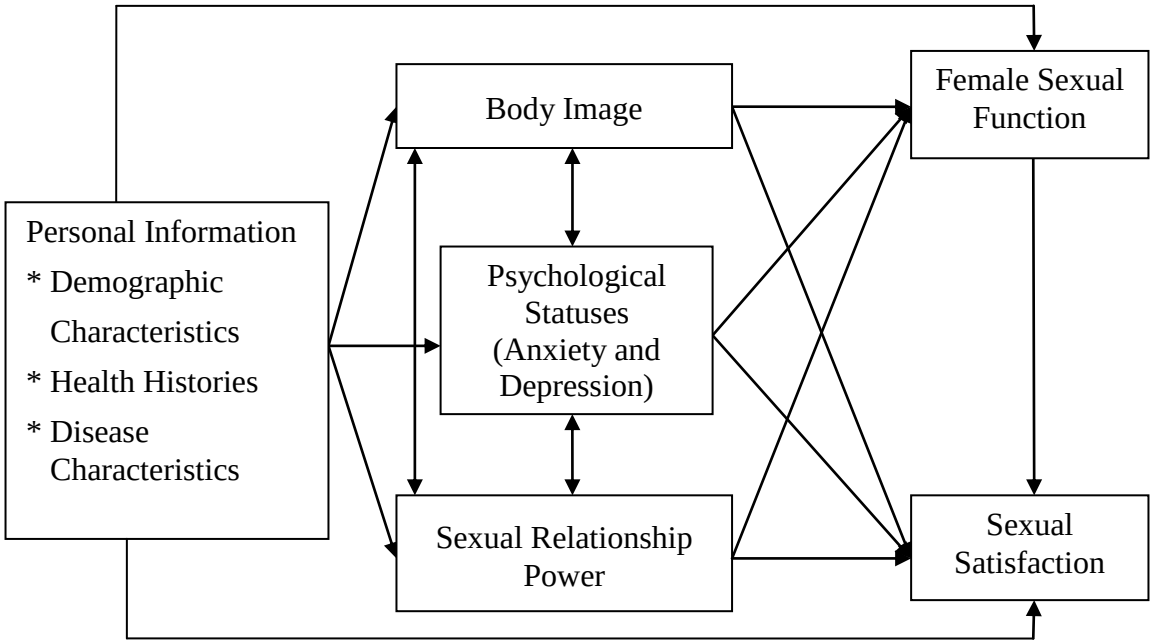
Feminist empiricism is used in the study to collect quantitative data to explore the phenomenon of female sexuality after rectal cancer and gynecological cancer treatments. Feminist empiricists tend to reduce possible biases by using their empirical questions and empiricist methods to make the traditional positivist paradigm more objective without throwing out or radically changing the traditional perspectives in ontology and epistemology (Leckenby, 2007). Moreover, the strength of feminist empiricism is that it can use and penetrate a wide range of languages and perceptive standards (Harding, 1991) and enhance the objectivity of existing science (Harding, 1986). In addition,

feminist empiricists trust that the social and political contexts of the research questions are measurable and observable, that the statistics can tell the story of gender and females, and that statistical methods need to be better employed by not only including females in the research and paying attention to their concerns but also making space for females in research settings (Leckenby, 2007).

The Conceptual Framework of Female Sexual Function and Sexual Satisfaction

The conceptual framework of the changes in female sexual function and sexual satisfaction after rectal cancer and gynecological cancer treatments organizes the theories and concepts related to female sexuality, female sexuality after rectal cancer and gynecological cancer treatments, and sexual self-schema. The relationships among the variables used in the proposed investigation are delineated in Figure 1.1 and Figure 1.2.

Figure 1.1 Conceptual Framework of Female Sexual Function and Sexual Satisfaction



Antecedents

As described in Figure 1.1, personal information, including demographic characteristics, health histories, and disease characteristics, is the antecedent that influences body image, psychological status (anxiety and depression), sexual relationship power, female sexual function, and sexual satisfaction.

Demographic characteristics include the participant's age, education level, ethnic origin, race, employment status, personal income from the previous year, marital status, gender of current partner, length of time with the current partner, the partner's age, and number of children. Health histories cover menopausal status, hormone replacement therapy (HRT) use, past medical history (diabetes or hypertension), and presence of previous sexual problems, and disease characteristics include cancer type, time since surgical operation, recurrence of the disease, stage of disease, type of treatment received (surgery, radiotherapy, chemotherapy, or preoperative radiotherapy), presence of a stoma, ECOG performance status, and receiving hospice care. All of these are likely to directly or indirectly affect female sexual function and sexual satisfaction and explain some of the variances in body image, psychological status, sexual relationship power, female sexual function, and sexual satisfaction.

Body Image and Psychological Status

In Figure 1.1, a bidirectional arrow is drawn between "Body Image" and "Psychological Statuses (Anxiety and Depression)" to demonstrate the relationship between these two variables. Body image can affect psychological status (Benrud-Larson

et al., 2003; Johnson & Wardle, 2005); however, females who have good psychological status can also have a positive body image (da Silva et al., 2008).

Body Image and Sexual Relationship Power

In Figure 1.1, a bidirectional arrow represents the relationship between "Body Image" and "Sexual Relationship Power." There is a potential positive relationship between body image and sexual relationship power.

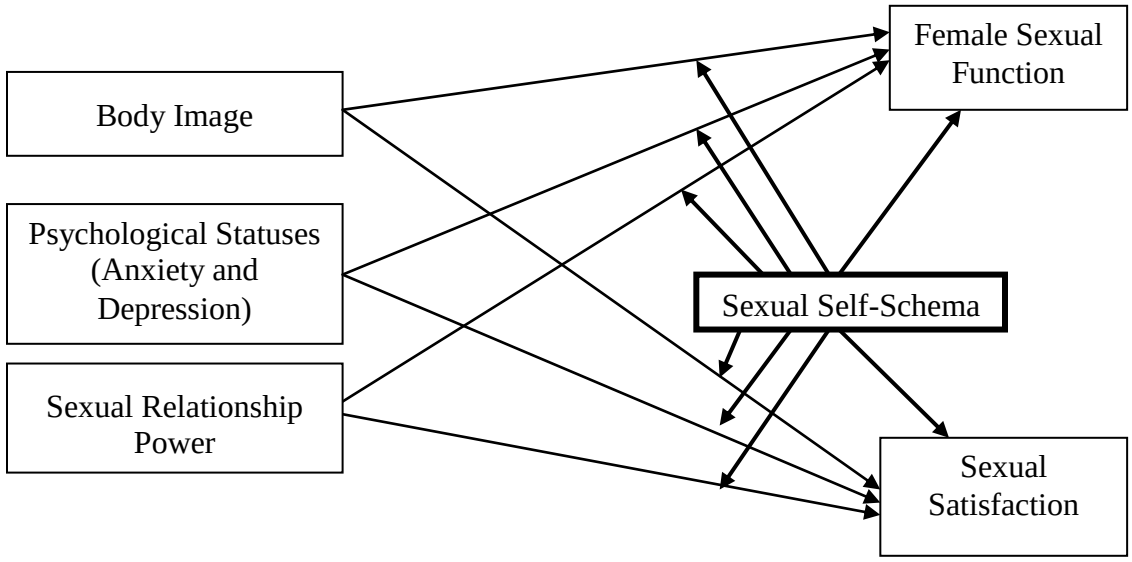
Psychological Status and Sexual Relationship Power

Figure 1.1 has a bidirectional arrow between "Psychological Statuses (Anxiety and Depression)" and "Sexual Relationship Power" to represent the association between the two. Females with good psychological status tend to have high sexual relationship power (Halloran, 1998).

Sexual Self-Schema

Figure 1.2 shows that sexual self-schema is a predictor for female sexual function and sexual satisfaction; in addition, it is also a moderator for the effects of body image, psychological statuses (anxiety and depression), and sexual relationship power on female sexual function and sexual satisfaction.

Figure 1.2 The Effect of Sexual Self-Schema on Female Sexual Function and Sexual Satisfaction



Outcomes

The outcomes of the model to assess female sexuality are female sexual dysfunction and sexual satisfaction. Sexuality includes body image, sexual response, sexual roles, and relationships (Pelusi, 2006) and is affected by physical, psychological, hormonal, medical, and social statuses (Anastasiadis, Davis, Ghafar, Burchardt, & Shabsigh, 2002; Salonia et al., 2004; Raina et al., 2007). The nongenital element also plays an important role in female sexuality (Leiblum, 1998), especially for the quality of relationships (Sprecher, 2002). Therefore, the outcome of sexual satisfaction is used to estimate the degree of sexual satisfaction with the partner.

Female sexual function and body image. In Figure 1.1, there is a unidirectional arrow from "Body Image" to "Female Sexual Function," meaning that body image influences female sexual function (da Silva et al., 2008).

Female sexual function and psychological status. Figure 1.1 shows a unidirectional arrow to represent the impact of psychological status on female sexual function.

Female sexual function and sexual relationship power. In Figure 1.1, there is a unidirectional arrow from "Sexual Relationship Power" to "Female Sexual Function" to demonstrate that sexual relationship power influences female sexual function.

Sexual satisfaction and body image. In Figure 1.1, a unidirectional arrow between "Female Sexual Satisfaction" and "Body Image" explains that body image affects sexual satisfaction. Females with better body image are likely to experience a more significant influence on their sexual satisfaction.

Sexual satisfaction and psychological status. Figure 1.1 shows a unidirectional arrow from "Psychological Statuses (Anxiety and Depression)" to "Sexual Satisfaction" to represent that sexual satisfaction is influenced by psychological status.

Sexual satisfaction and sexual relationship power. In Figure 1.1, a unidirectional arrow from "Sexual Relationship Power" to "Sexual Satisfaction" expresses that sexual relationship power might influence sexual satisfaction.

Female sexual function and sexual satisfaction. Sexual satisfaction is a personal evaluation of the sexual relationship (Hurlbert & Apt, 1994; Lawrence & Byers, 1995), and relationship satisfaction is important in assessing female sexual function (Byers, 2001). Furthermore, MacNeil and Byers (1997) found that sexual dysfunction significantly predicts sexual satisfaction. Therefore, in Figure 1.1, "Female Sexual Function" shows an impact on "Sexual Satisfaction."

Research Questions

The specific research questions and associated hypotheses generated from the conceptual framework in this study of females with rectal/gynecological cancer and females without any cancer are as follows:

Question 1: Are there differences among demographic characteristics, health histories, and disease characteristics with respect to (a) body image, (b) anxiety and depression, (c) sexual relationship power, (d) female sexual function, and (e) sexual satisfaction?

Question 2: What is the relationship among body image, psychological status (anxiety and depression), sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction?

Question 3: Does female sexual self-schema moderate (or mediate) the effects of body image, psychological status (anxiety and depression), and sexual relationship power on female sexual function and sexual satisfaction?

Question 4: What are the differences in female sexual function and sexual satisfaction in females with rectal or gynecological cancer and females without any cancer?

Definitions

According to the purpose of the study, the variables in the concept framework are defined as follows:

Rectal cancer: Rectal cancer is defined as a malignant tumor(s) occurring in the rectum or anus that is diagnosed by a physician and treated with surgical treatments (including APR, AR, HAR, and LAR) and nonsurgical treatments (including radiotherapy, chemotherapy, and preoperative radiotherapy).

Gynecological cancer: Gynecological cancer is defined as a malignant tumor(s) occurring in the uterus, ovaries, vagina, or vulva that is diagnosed by a physician and treated with surgical treatments (including radical hysterectomy, radical vulvectomy, oophorectomy, ostomy surgery, and pelvic exenteration) and nonsurgical treatments (including pelvic irradiation with and without vaginal irradiation and chemotherapy).

Demographic characteristics: Demographic characteristics, such as age, education level, ethnic origin, race, employment status, personal income from the previous year, marital status, gender of current partner, length of time with the current partner, the partner's age, and number of children, may directly and indirectly influence female sexual function and sexual satisfaction.

Health histories: Health histories, such as menopausal status, HRT use, past medical history, and presence of previous sexual problems, may directly and indirectly influence female sexual function and sexual satisfaction.

Disease characteristics: Disease characteristics, such as cancer type, related treatments, ECOG performance status, stage of disease, recurrent or not, time since surgical operation, receiving hospice care, and presence of a stoma, may directly and indirectly affect female sexual function and sexual satisfaction.

Body image: Body image plays a key role in females' sexual self-concept associated with the feelings of being feminine and attractive (Cohen et al, 1998; White, 2000).

Anxiety and depression: Anxiety and depression are emotional disorders sometimes brought on by the stress of physical diseases, which may cause more complicated clinical symptoms and poor response to treatment (Zigmond & Snaith, 1983), and may influence sexual activities (Carmack Taylor et al., 2004).

Sexual relationship power: Sexual relationship power is the ability to make decisions independently, the ability to control the partner's actions, or the ability to negotiate one's own needs in the relationship (Harvey, Beckman, Browner, & Sherman, 2002; Kritcharoen, Suwan, & Jirojwong, 2005; Pulerwitz et al., 2000).

Sexual self-schema: Sexual self-schema is an individual's view of his or her sexuality and is defined as a cognitive generalization regarding sexual aspects of the self (Andersen & Cyranowski, 1994; Cyranowski et al., 1999).

Female sexual function: Female sexual function is defined as involving the sexual response process that includes desire, arousal, and orgasm (Kaplan, 1979) and is affected

by demographic characteristics, disease characteristics, body image, psychological status (anxiety and depression), sexual relationship power, and sexual relationships.

Sexual satisfaction: Sexual satisfaction is a personal evaluation of the sexual relationship, including the satisfaction with the sexual life and needs and the fulfillment of each other's sexual expectations (Hurlbert & Apt, 1994; Lawrence & Byers, 1995).

Assumptions

For the purpose of this study, the following assumptions are made:

1. Female sexuality is multidimensional and complex.
2. Females with rectal cancer or gynecological cancer want to have satisfying sexual lives with their partners, as do females without any cancer.
3. Females will report their sexual function and satisfaction and other relevant factors accurately.
4. Females with rectal cancer or with gynecological cancer will view cancer and its treatments as factors affecting their body image, psychological statuses (anxiety and depression), sexual relationship power, sexual satisfaction, and sexual responses regarding their sexuality.
5. According to the viewpoints of radical feminism and the theory of gender and power, power inequality within a couple influences their sexual relationship; therefore, sexual relationship power equality has a positive impact on sexuality.

Summary

In this first chapter, the topic is introduced, significance is recognized, the purpose and the problems are stated, the theoretical framework is presented and explained, research questions and hypotheses are discussed, definitions of each concept are provided, assumptions are described, and limitations are acknowledged. The purpose of this study is to examine the impact of rectal cancer and gynecological cancer on sexual function and sexual satisfaction; explore the factors that influence female sexual function and sexual satisfaction, especially for the factor of sexual relationship power based on radical feminism and the theory of gender and power; and examine the effect of sexual self-schema on the associations among body image, psychological status, sexual relationship power, sexual function, and sexual satisfaction. The findings of the study have implications for advancing information about female sexuality, designing appropriate interventions to prevent or decrease female sexual dysfunction, and enhancing sexual satisfaction after rectal cancer and gynecological cancer. Chapter Two will present a review of the literature related to each variable and relationship in the conceptual framework of this study.

Chapter 2: Literature Review

This review of the literature is based on the variables and the relationships between variables of the conceptual framework introduced in Chapter 1 to describe: (1) effects of rectal cancer and gynecological cancer and treatments on female sexual function; (2) female sexual function and its related factors, including body image, anxiety and depression, sexual relationship power, and sexual satisfaction; and (3) how sexual self-schema moderates the relationships between anxiety and depression, body image, sexual relationship power, sexual function, and sexual satisfaction. The final part of this chapter will be a summary of the literature and will organize the findings of the studies to support the conceptual framework presented in Chapter 1.

Effects of Rectal Cancer and Gynecological Cancer and Treatments on Sexual Function

Rectal cancer, gynecological cancer, and their treatments affect the physical and psychological realms of females' ability to maintain their sexual function (da Silva et al., 2008; Hawighorst-Knapstein et al., 2004; Lamb, 1990). Sexual dysfunction results from different surgical procedures, various adjuvant treatments, and their consequent side effects (Hughes, 2008; Li, 2009).

Rectal Cancer and Female Sexual Function

APR, AR, LAR, HAR, and sphincter-saving resections are common surgical procedures for dealing with rectal cancer (Keating, 2004; Salonia et al., 2006; Zippe et

al., 2006). Each of these surgical procedures causes different levels of sexual dysfunction depending on the degree of damage to small vessels and autonomic nerves in the pelvis (McLeish, 2004; Zippe et al., 2006), especially with the APR procedure, which has the highest incidence of sexual dysfunction, followed by the LAR and HAR procedures (Engel et al., 2003; Guren et al., 2005; Schmidt, Bestmann, Kuchler, & Kremer, 2005). APR includes extended resection, inducing greater damage to the pelvic parasympathetic nerves and pelvic plexus (Munday, 1982). Under normal circumstances, the stimulation of parasympathetic nerves leads to the release of vasoactive intestinal polypeptide in the vagina, increasing vaginal lubrication (Ottesen & Fahrenkrug, 1995), and to the vascular engorgement of the clitoris and labia (Tyrer et al., 1983). Therefore, the impairment of pelvic parasympathetic nerves influences vaginal lubrication, causing dryness and dyspareunia (Hojo, Vernava, Sugihara, & Katumata, 1991; Keating, 2004; Tyrer et al., 1983). Furthermore, the surgical creation of an ostomy forces patients to face the alteration of fecal elimination and appearance, and these dramatic changes have an impact on their physical and psychological statuses, inducing sexual problems (Sprunk & Alteneder, 2000).

Research studies have expressed that males and females experiencing rectal cancer treatment felt it had an impact on their sexuality; some of them even reported having no sexual activity after rectal cancer surgery (da Silva et al., 2008; Guren et al., 2005; Hendren et al., 2005; Schmidt et al., 2005a; Tekkis et al., 2009; Vironen et al., 2006). The specific sexual dysfunctions in females with rectal cancer include libido, arousal, lubrication, orgasm, and dyspareunia. Dyspareunia and lubrication disorders are

the most commonly reported sexual dysfunctions after rectal cancer surgery (Böhm et al., 2008; Hendren et al., 2005; Tekkis et al., 2009). However, the research has found that the patient's age ($p < .001$), surgical procedures ($p < .003$), and preoperative sexual functions ($p = .001$) were independently related to sexual activity among patients with rectal cancer surgery (Hendren et al., 2005). Furthermore, patients with an ostomy had worse sexual function and more sexual problems than those without an ostomy (Engel et al., 2003; Fucini, Gattai, Urena, Bandettini, & Elbetti, 2008; Schmidt et al., 2005).

Decreased attractiveness and body image changes are two psychological variations of responses in sexual dysfunction among females after rectal cancer surgery (Keating, 2004), and a tendency for depression was also detected in these females (Rauch, Miny, Conroy, Neyton, & Guillemin, 2004). Females who underwent rectal cancer surgery felt more ashamed of their bodies than males with rectal cancer did and thought their partners perceived them as less attractive; therefore, females experienced a loss of sexual spontaneity (Hendren et al., 2005; Platell et al., 2004). Furthermore, females with an ostomy had significantly worse body image, sexual avoidance, communication, intercourse frequency, and sexual function compared to males with an ostomy (Kilic, Taycan, Belli, & Ozmen, 2007), and females with an ostomy expressed more negative effects on appearance, relationships, and intimacy than females without an ostomy (Krouse et al., 2009). In addition, the findings of research studies also showed that people with an ostomy had significantly diminished body images and high levels of depression compared with those without an ostomy (Fucini et al., 2008; Ross et al., 2007; Sideris et al., 2005).

Regarding the effect of the passage of time since surgery, da Silva et al. (2008) found that body image and mental status among females who experienced colorectal cancer surgery significantly improved at 6 months and 12 months after surgery compared with their preoperative status. However, Gervaz et al. (2008) explained that quality of life among patients with APR had improved significantly ($p = .001$) by a one-year follow-up after surgery, but their body image ($p = .99$) and sexual dysfunction ($p = .40$) did not have significant improvements. Furthermore, people receiving APR reported significantly impaired sexuality over time compared with those receiving AR at the third-month, sixth-month, and twelfth-month postoperative follow-ups (Schmidt, Bestmann, Kuchler, Longo, & Kremer, 2005b). However, Tekkis et al. (2009) expressed that the frequency of sexual intercourse among females experiencing APR improved significantly over time when comparing their four-month and five-year follow-ups after surgery ($p = .028$).

Gynecological Cancer and Female Sexual Function

Hysterectomy (Wertheim's hysterectomy), vulvectomy, oophorectomy, ostomy surgery, and pelvic exenteration are surgical procedures used to treat gynecological cancer (Carmack Taylor et al., 2004; Carter et al., 2004; Lamb, 1990). Each of these surgical procedures has a different impact on sexual function. Radical hysterectomy leads to shortening of the vaginal canal; ovarian dysfunction; and damage to vascular, automatic, and sensory pelvic nerves, which induce vaginal vasocongestion, vaginal dryness, and expansion (Jensen et al., 2004; Lamb, 1990). Radical vulvectomy causes

diminution of the fine sensory perception in the perineum, which affects sexual arousal and can cause a change in body image (Andersen & Hacker, 1983; Lamb, 1990). Oophorectomy triggers a surgical menopause in premenopausal women because of the reduction of estrogen, progesterone, and androgen, leading to menopausal symptoms such as vaginal atrophy and thinness, a disorder affecting vaginal lubrication, hot flashes, and night sweats (Carmack Taylor et al., 2004). Also, ostomy surgery affects body image and innervation in the pelvis, which causes sexual problems (Lamb, 1990). Pelvic exenteration is conducted for advanced or recurrent cervical, vaginal, or vulvar cancer and involves the excision of pelvic viscera, including the uterus, ovaries, vagina, bladder, rectosigmoid colon, and adjacent tissue (Carter et al., 2004; Crowe, Temple, Lopez, & Ketchman, 1999; Sevin & Koechli, 2001), and this procedure drastically affects body image, self-esteem, attractiveness, self-confidence, relationships with partners, and sexual function, such as vaginal dryness and vaginal discharge (Hawighorst-Knapstein et al., 2004; Lamb, 1990; Ratliff et al., 1996).

Self-image and sexuality are two important issues that females with gynecological cancer are concerned with before and after the treatments (Bradford & Meston, 2007; Burns, Costello, Ryan-Woolley, & Davidson, 2007; Carter et al., 2004; Ekwall, Ternestedt, & Sorbe, 2003; Harris, Good, & Pollack, 1982). Research studies have demonstrated that gynecological cancer treatments negatively affect sexuality, body image, and anxiety (Bukovic et al., 2008; Burns et al., 2007; Carmack Taylor et al., 2004; Harris et al., 1982; Ratliff et al., 1996; Hawighorst-Knapstein et al., 2004). Dyspareunia was the most often reported sexual dysfunction (Thranov & Klee, 1994; Bukovic et al.,

2008), and lack of interest in sexual activities was manifested among females with gynecological cancer after the treatments (Burns et al., 2007; Carmack Taylor et al., 2004; Corney, Crowther, Everett, Howells, & Shepherd, 1993; Donovan et al., 2007; Hawighorst-Knapstein et al., 2004; Thranov & Klee, 1994). Furthermore, Donovan et al. (2007) found that the patient's level of education, time since diagnosis, hormone therapy use, partner relations, and physical appearance were significant predictors that accounted for 49% of the variance in sexual interest among 50 females with cervical cancer. Females who had a high level of education, had recently undergone hormone therapy, had been diagnosed a long time ago, had better physical appearance, or had better partner relations were significantly likely to report high sexual interest (Donovan et al., 2007). In addition, females who had a hysterectomy with oophorectomy significantly tended to report a lack of enjoyment of sex compared to females who had a hysterectomy without oophorectomy (Greenwald & McCorkle, 2008). Furthermore, vaginal dryness, orgasm disorder, and pain/discomfort during intercourse were the major sexual dysfunctions among females with ovarian cancer (Carmack Taylor et al., 2004).

Judging from a review of the previous studies, it appears that researchers rarely included both women with gynecological cancer and women with rectal cancer who might undergo pelvic surgery and suffer the similar sexual dysfunctions in studies to explore their sexual function and sexual satisfaction after the disease.

Adjuvant Therapy and Female Sexual Function

Treatments for cancer not only include surgical procedures but also adjuvant therapy, including chemotherapy and radiotherapy, to prevent local recurrent or distant metastases (Madoff, 2004; Rich et al., 1995). However, chemotherapy and radiotherapy negatively affect sexual function (Madoff, 2004) because of the damage to pelvic neurovasculature and because of ovarian and vaginal toxicity (Tierney, 2008); the severity of the effects depends on patient age, the dosage of radiotherapy and chemotherapy, and the type of chemotherapy (Tierney, 2008).

Radiotherapy. The ovaries and the vaginal canal are two main areas of concern associated with sexual function after radiation therapy. Radiotherapy causes damage to the pelvic vascular and nerve structures, inducing dyspareunia and other sexual dysfunction, and vaginal toxicity results in postcoital bleeding, vaginal stenosis, fibrosis, shortening, narrowing, dryness, loss of elasticity, decrease in vaginal sensation, difficulty in achieving orgasm, reduced vaginal lubrication, and ovarian failure, leading to premature menopause in premenopausal patients (Bergmark, Avall-Lundqvist, Dickman, Henningshohn, & Steineck, 1999; Cartwright-Alcarese, 1995; Frumovitz et al., 2005; Jensen et al., 2004; Lamb, 1990; Schover, Fife, & Gerhenson, 1989; Schover, 2005; Vistad, Fossa, & Dahl, 2006).

Research studies reported that patients experiencing rectal cancer surgery and radiotherapy had worse sexual function compared with those who experienced surgery alone (da Silva et al., 2008; Guren et al., 2005; Hendren et al., 2005), and the symptom of dyspareunia for females experiencing radiotherapy showed a 4.68-fold increase compared

with females experiencing rectal cancer surgery alone (Tekkis et al., 2009). This viewpoint was also supported by Greimel, Winter, Kapp, and Haas's study (2009), which demonstrated that females who underwent cervical cancer surgery and radiotherapy reported a lower sexual activity rate than females who underwent surgery alone or surgery and chemotherapy. Moreover, females with cervical cancer had persistent sexual dysfunction and adverse vaginal changes throughout the two years following radiotherapy, including lack of sexual interest and lubrication, dyspareunia, and dissatisfaction with sexual life (Jensen et al., 2004), and the study by Frumovitz et al. (2005) reported that cervical cancer survivors who were treated with radiation had significantly poorer quality of life, psychosocial distress, and sexual functioning. In a sample of 105 females with gynecological cancer following radical pelvic-surgery, 82% of females who were younger than 50 years old and had had radiotherapy reported that they experienced sexual dysfunction (Corney et al., 1993).

Chemotherapy. Chemotherapy influences gonadal function, inducing amenorrhea and menopausal symptoms that decrease sexual arousal, libido, orgasm, and sexual interest and cause vaginal irritation and dyspareunia (Hughes, 2008; Lamb, 1990; Schover, 2005; Shell, Carolan, Zhang, & Meneses, 2008). The loss of hair, anorexia, weight losses or gains, lethargy, bone marrow, and depression are other side effects of chemotherapy that lead to changes in body image, self-esteem, and fatigue (Hughes, 1996; Lamb, 1990), all of which indirectly affect sexual desire and decrease sexual activities (Hughes, 1996). In addition, research studies have found that adjuvant chemotherapy had a negative effect

on mental health (da Silva et al., 2008), and a history of chemotherapy is an important predictor for female sexual dysfunction (Alder et al., 2008).

However, the surgical procedure and adjuvant therapy are not the only factors; the stage of disease, recurrence, time since diagnosis, active treatment, and preoperative sexual activity also influence female sexual function and sexual activities (Bukovic et al., 2008; Carmack Taylor et al., 2004; Fasching et al., 2007; Greenwald & McCorkle, 2008; Hendren et al., 2005). Whether the disease is recurrent had an impact on the deterioration of sexual life among females with gynecological cancer and breast cancer ($p < .001$; Fasching et al., 2007). Furthermore, Greenwald and McCorkle (2008) found that females with cervical cancer who were diagnosed in stage one reported less harm to their relationships related to sexuality and sexual dysfunction compared with females whose cancers were in more advanced stages ($p < .05$). Furthermore, females with ovarian cancer who had more time since diagnosis ($p < .59$) or who weren't actively undergoing treatment ($p < .004$) were more likely to be sexually active (Carmack Taylor et al., 2004), and females with rectal cancer who were sexually active tended to have been sexually active before surgery (Hendren et al., 2005).

In summary, related studies have demonstrated that females who experienced gynecological cancer or rectal cancer surgery and adjuvant treatments had different degrees of change in body image, psychological status, sexual function, and sexual satisfaction.

Female Sexual Function

The World Health Organization gave a three-part explanation of "sexuality": (1) Sexuality is a central aspect of being human throughout life and encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy, and reproduction; (2) sexuality is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behavior, practices, roles, and relationships; and (3) sexuality is influenced by the interaction of biological, psychological, social, economic, political, cultural, ethical, legal, historical, religious, and spiritual factors (Khanna, 2004, p. 3) Sexuality is an interpersonal condition (McCarthy, 2004), and intimacy is an imperative part of sexuality, especially for females. Female sexual function is complicated and multidimensional (McCarthy, 2004), depending not only on physical factors but also on psychological factors, including the interpersonal relationship (Basson et al., 2003; Sprecher, 2002).

The two major perspectives of radical feminists on female sexuality differ in that, in one, males tend to control females' bodies, resulting in the power inequality in sexual relationships (Tong, 1989); in the other, males have constructed female sexuality to meet males' needs and interests without regard for females' feelings and thoughts (Tong, 1989). Furthermore, Basson and colleagues (2000) found that many females are not satisfied with their sexual relationships although they achieve physical arousal or orgasm; this viewpoint was supported by Sprecher (2002), who explained that female sexual satisfaction is significantly related to the quality of the relationship.

A sexuality expert, Basson (2000) provided four reasons to explain that the female sexual response model is different from Masters and Johnson's model (1966) and Kaplan's model (1979). First, females, who are less affected by testosterone, have less physical drive to release sexual tension than males; second, females' motivation to engage in sexual activities is based on rewards that are not always associated with physical sexual urges; third, female sexual arousal is a kind of "subjective mental excitement"; and fourth, the release of sexual urges may or may not happen in females (p. 52). In response to these findings, Basson (2001a) provided an alternative sex response cycle to encompass the multiple factors of sexual difficulties based on emotional intimacy, and this alternative focuses on sexual experiences that begin with "a nonsexual status of mind," especially for females. This alternative human sexual response cycle has six stages, including emotional intimacy, sexual neutrality, sexual stimuli, sexual arousal, sexual desire and arousal, and emotional and physical satisfaction (Basson, 2001a). Furthermore, Basson (2001b) used an intimacy-based sexual response model, which includes five stages—intimacy needs, sexual stimuli, sexual arousal, sexual desire, and enhanced intimacy—to explore 47 females' experiences related to low sexual desire, and the findings showed that 85% of females with low sexual arousal had psychological problems, especially depression, and that 50% didn't have sufficiently intimate feelings for their partners to induce sexual stimuli to evoke their sexual arousal.

Furthermore, Kingsberg (2002) demonstrated that ethnicity, race, education levels, socioeconomic status, sexual orientation, financial resources, and religion have an impact on females' sexual self-perception. The research study found that African-

American and Latina females were likely to report higher sexual desire than Caucasian and Asian females (Huang et al., 2009), that African-American and Asian females had lower sexual frequency than Caucasian females, and that Latina females tended to report higher sexual frequency than Caucasian females (Huang et al., 2009). Furthermore, Carmack Taylor et al. (2004) explained that non-Hispanic white females with ovarian cancer had higher sexual function compared to females of other ethnic groups, and this result was also supported by Greenwald and McCorkle (2008), showing that Caucasian females with cervical cancer tended to be sexually active. However, there was a bias in these two studies because Caucasian females made up the majority of the sample population in them (85% and 92.7%). In addition, females with an annual family income of more than $60,000 reported more sexual activity than females with an annual family income of less than $59,999 (Greenwald & McCorkle, 2008), and females with high education levels were likely to have high sexual function and satisfaction (Carmack Taylor et al., 2004). Therefore, female sexual function is multidimensional and related to not only physical, physiological, hormonal, and medical conditions but also to psychological and social factors (Anastasiadis et al., 2002; Salonia et al., 2004; Raina et al., 2007).

Age and Female Sexual Function

Female sexual dysfunction is a progressive, age-related problem accompanying the changes of physical and psychological status that significantly influence a female's sexuality (Raina et al., 2007; Vardi, 2006). As females' ages increase, their sexual

function declines incrementally to menopause, affected by the levels of estrogen and testosterone, chronic diseases affecting vessels and nerves, and partner-related issues, such as erectile dysfunction, the lack of a partner, and a partner with health problems (Kingsberg, 2002; Raina et al., 2007). Lubrication problems, a lack of sexual interest, and less sexual activity were significantly more common in older females than younger females among the general population across different ethnic groups (Huang et al., 2009). Furthermore, age also has been demonstrated to be an important variable in studies related to female sexual function after rectal cancer and gynecological cancer (Carmack Taylor et al., 2004; Hendren et al., 2005; Keating, 2004; Schmidt et al., 2005a; Thranov & Klee, 1994).

From the findings of related research studies, Thranov and Klee (1994) concluded that females younger than 55 tended to be more sexually active than females older than 55, and this result was also supported by Carmack Taylor et al. (2004) and Hendren et al. (2005), who found that sexually active females were younger and more likely to have been sexually active before surgery. Furthermore, females who were younger than 65 had more suffering and distress about sexual dysfunction than older females after rectal cancer surgery (Schmidt et al., 2005a), and females aged 65 or younger experienced more dyspareunia than older females after rectal cancer resection (Tekkis et al., 2009). In addition, females with ovarian cancer who were younger than 55 had significantly worse sexual function ($p < .001$) (Bukovic et al., 2008). However, older females were significantly less sexually active and had less sexual intercourse than younger females (Tekkis et al., 2009; Lange et al., 2009).

Menopause. Menopause causes a decrease in estrogen and testosterone, the predominant female sexual hormones (Raina et al., 2007). The function of estrogen is the regulation of sexual function and the synthesis of nitric oxide in the vagina and clitoris, and it has a vasoprotective and vasodilator impact on the vagina (Raina et al., 2007); therefore, the decrease of estrogen levels causes dyspareunia related to vulvovaginal atrophy (Frank, Mistretta, & Will, 2008). Estrogen also plays a crucial role in the regulation of norepinephrine-related and serotonergic activities, and the decrease of these neurotransmitter activities might cause the increase of depression in postmenopausal women (Halbreich, 1997). Therefore, estrogen therapy has been used to treat postmenopausal women with depression (Schneider, Brotherton, & Hailes, 1977).

The function of testosterone is related to sexual arousal, libido, sexual response, genital sensation, and orgasm (Sherwin & Gelfand, 1985), as well as to the enhancement of nitric oxide synthesis activity, which makes vascular smooth muscles relax (Rako, 2000); the deficiency of testosterone has an impact on hypoactive sexual desire (Frank et al., 2008). Therefore, estrogen replacement therapy and androgen replacement therapy are used to improve vaginal lubrication and sexual desire (Berman & Goldstein, 2001; Raina et al., 2007). The study also found that premenopausal females and females with hormone replacement therapy (HRT) had significantly better scores for female sexual function than postmenopausal females and females without HRT after colorectal cancer surgery (da Silva et al., 2008).

Chronic Disease. Chronic diseases might make females experience secondary sexual dysfunction, and diabetes, hypertension, and hyperlipidemia are the most common risk

factors for sexual dysfunction because of atherosclerosis (Raina et al., 2007). Atherosclerosis causes the decrease of blood flow from the hypogastric or pudendal arterial bed to the clitoris and vagina, which leads to the loss of corporal smooth muscle in the vagina and clitoris, creating fibrosis (Goldstein & Berman, 1998; Park et al., 1997). Furthermore, diabetes leads to not only poor vascular flow but also autonomic neuropathy and a decrease of nitric oxide synthase production (Morley & Tariq, 2003), resulting in reduced vaginal lubrication, loss of genital sensation, dyspareunia, and orgasm and libido disorder (Meeking & Fosbury, 1998). Studies have also found that females with diabetes had worse sexual function than females without diabetes (Enzlin et al., 2002; Lemone, 1996). However, female sexual function cannot be confined to a single leading factor, and the etiology is always mixed and complicated because it involves vascular and neurogenic disorders (Raina et al., 2007). Pelvic surgeries, including those for rectal cancer and gynecological cancer, that would have an impact on pelvic vessels and nerves affecting female sexual function were discussed previously.

Partner Issues. McCarthy (2004) expressed that sexuality is an interpersonal condition, and the partner plays an important role in sexual rehabilitation after cancer (Bukovic et al., 2008). The partner's age, sexual function, and physical problems; the partnership itself; the quality of communication and relationship; and sufficient sexual information can influence female sexual function (Carmack Taylor et al., 2004; Fasching et al., 2007; Kingsberg, 2002; Walsh & Berman, 2004). Furthermore, McCarthy's study demonstrated that the most common problems causing females to be sexually inactive were lack of sexual interest (39%), lack of partner (36%), partner's physical problem (23%), and lack

of interest by partner (11%) in a sample of 1,977 females aged 45 to 80 (Huang et al., 2009). Therefore, the role of the partner cannot be ignored when exploring female sexual function. However, the qualitative research expressed that females who had good communication with their partners found that they had loving relationships after gynecological cancer (Molassiotis et al., 2002), and this point was also supported by Rasmusson and Thome (2008), who found that couples whose relationship includes good communication can deal with their changed sexual situation after gynecological cancer. Moreover, Fasching et al. (2007) found that a new partnership had a positive impact on accommodating the changes. However, a partner with sexual dysfunction, such as erectile dysfunction or lack of interest, has a negative influence on female sexual function (Carmack Taylor et al., 2004; Kingsberg, 2002), especially related to males experiencing their midlife changes in hormonal levels, blood flow, libido, sensitivity, and ejaculation. These changes might affect their ability to maintain a quality erection (Kingsberg, 2002). In addition, if males have mild sexual dysfunction in their forties, they will likely progress to moderate or severe sexual dysfunction as their age increases (Kingsberg, 2002).

Regarding sexuality, the study showed that females needed sexual information before and after cancer treatment (Rasmusson & Thome, 2008) and needed to discuss how the disease and the treatments would influence their health, sexuality, and body image (Ekwall et al., 2003). Juraskova et al. (2003) explained that most females with cervical cancer and endometrial cancer felt their partners were afraid to resume sexual intercourse because of a great fear of causing pain or physical damage, results similar to

Harris et al.'s study (1982), which found that most females believed their partners were most concerned or fearful about pain. Moreover, if patients had an ostomy, their partners often had a negative reaction or felt hesitant to engage in sexual activities because of a fear of injuring the ostomy (Sprunk & Alteneder, 2000). Therefore, sufficient information related to the consequences of the disease and its treatments is important to minimize the negative effects on sexual relationships and sexual function (Rasmusson & Thome, 2008).

In summary, female sexual function changes as females age. Also, studies have provided evidence that menopause, chronic diseases, and partner issues (including partner's age, the quality of communication, partner's physical status, and partner's sexual function) are also directly or indirectly related to female sexual function. Furthermore, females with different ethnic/racial backgrounds, education levels, and financial statuses have different attitudes toward their sexual function and satisfaction.

Body Image and Female Sexual Function

Wiederman (2002) described body image as the subjective perception of one's body and impression of how it appears to others. According to McKinley (2002), females' normative body dissatisfaction is not a function of individual pathology but a systematic social phenomenon; therefore, understandings of "masculinities" and "femininities" are considered "cultural scripts" that connect males and females with different attitudes (Miers, 2002). Western societies create a duality between mind and body, and females are associated with the body while males are associated with the mind

(McKinley, 2002). Furthermore, females are more concerned with the social aspects of body image and compare their appearances to those of other females more frequently than males compare their appearances to those of other males (Davison & McCabe, 2005). Therefore, how females come to view their bodies as objects to be cared for has an important impact on body image (McKinley, 2002).

Body image is a component of females' sexual self-concept, which is related to femininity and attractiveness and affects self-image, feelings, and interpersonal relationships (Cohen, Kahn, & Steeves, 1998; Junkin & Beitz, 2005; White, 2000). Therefore, body image is a key part of sexuality (Wiederman, 2002). The changes of body image include not only the external alterations, such as appearance, but also internal alterations, such as feelings of attractiveness (Butler, Banfield, Sveinson, & Allen, 1998; Thaler-DeMers, 2001). In addition, females from different ethnic or racial backgrounds might have varied attitudes toward their bodies that are based on their social and cultural contexts (Crago & Shisslak, 2003). However, Grabe and Hyde's study (2006), in which a meta-analysis was conducted to explore the relationship between ethnicity and body dissatisfaction among females in the United States, showed that Caucasian females had more dissatisfaction with their bodies compared with African-American females, but this difference was small (d = .29). Furthermore, the results of other comparisons between Caucasian, Asian, and Hispanic females showed differences that were also very small, and many results were close to zero, which meant there was not much difference in body dissatisfaction across different ethnic or racial groups (Grabe & Hyde, 2006). As for patients with cancer, Ashing-Giwa et al. (2004), who conducted qualitative research,

found that African American, Asian American, and Latina breast cancer survivors reported that self-acceptance was harder for younger females, that Asian Americans avoided looking at their bodies in the mirror, and that Latinas had more concern about weight gain that influenced their body images. However, Phipps, Braitman, Stites, and Leighton (2008) found there were no significant differences of body image across races in a sample of 30 survivors of colon cancer (50% African American and 50% Caucasian).

As females age, menopause may cause changes in skin texture, breast shape and size, and facial hair (Tierney, 2008). One study showed that females who were older than 50 experienced less or no negative effects of body image on their sexual lives and relationships when compared with younger females after breast cancer surgery (Ashing-Giwa et al., 2004), and similar results were reported by da Silva et al. (2008), who explained that a good body image was significantly associated with older age (> 40 years), better mental health, better sexual function, and higher self-esteem before experiencing colorectal cancer surgery. Furthermore, the studies demonstrated that dissatisfaction with body image was significantly related to high levels of depression (Benrud-Larson et al., 2003; Johnson & Wardle, 2005).

The consequences of cancer and its treatments cause negative changes to body image (Burns et al., 2007; Engel et al., 2003; Gervaz et al., 2008; Hawighorst-Knapstein et al., 2004; Hendren et al., 2005; Krouse et al., 2009; Platell et al., 2004; Ross et al., 2007; Sideris et al., 2005), and these changes might be temporary, such as body weight changes and the loss of hair, or permanent, such as the scarring caused by surgeries and the presence of an ostomy (Tierney, 2008). Furthermore, the altered body image may

persist for several months, even for several years, especially for patients with an ostomy (Engel et al., 2003; Fucini et al., 2008). In studies, patients with an ostomy had diminished body image compared with those without an ostomy (Fucini et al., 2008; Kilic et al., 2007; Sideris et al., 2005), and females with an ostomy were more disturbed about their perceptions of body image than were males with an ostomy (Kilic et al., 2007).

Research studies have demonstrated that the changes in body image are significantly related to female sexual dysfunction (Bodurka & Sun, 2006; Carmack Taylor et al., 2004; da Silva et al., 2008; Fobair et al., 2006; Fucini et al., 2008; Kilic et al., 2007). Furthermore, Pujols, Meston, and Seal (2010) expressed that there were positive relationships between female sexual function, sexual satisfaction, and body image. However, da Silva et al. (2008) found that worsened body image was significantly associated with worsened sexual function in females over 35 years old; in addition, a single relationship status and a high BMI negatively influenced the perception of body image (da Silva et al., 2008). In addition, females who were married, were younger than 56 years, were not actively receiving treatment, had a longer elapsed time since initial diagnosis, and had higher satisfaction with their body appearances tended to be sexually active (Carmack Taylor et al., 2004).

In summary, body image has been evidenced as an important factor in female sexual function and satisfaction, and it is influenced as females age. Females with different ethnic/racial contexts have different perspectives of their bodies. Furthermore, cancer surgery and its treatments, marital status, the relationship with the partner,

psychological symptoms, time since diagnosis, and presence of an ostomy are potential factors that also have an impact on sexual function and satisfaction.

Depression and Anxiety and Female Sexual Function

The mood disorder for which patients most commonly seek psychological counseling is depression (Williams et al., 1995). Gender differences exist in depression; it has been evidenced that females in general have a higher prevalence of depression than males (Marcus et al., 2005; Romans, Tyas, Cohen, & Silverstone, 2007; Williams et al., 1995). Romans et al. (2007) showed that the female-to-male ratio of major depressive disorder prevalence was 1.64:1 (1,098 females and 668 males) and that females had significantly more depression symptoms than males ($t = 3.72$, $p < .001$). In addition, the results of Williams et al.'s study (1995) showed that 15% of females were diagnosed with a major depressive disorder compared with 6% of males (odds ratio = 2.6, $p < .01$). However, explanations for the differences between genders regarding depression include psychological, neurochemical, anatomical, hormonal, genetic, and personality factors (Grigoriadis & Robinson, 2007). Furthermore, females were more likely to have depression with comorbid anxiety (Breslau, Schultz, & Peterson, 1995), and this comorbidity of depression and anxiety is a high risk factor for suicide attempts (Bronisch & Wittchen, 1994).

Many patients experienced depression (Berard, Boermeester, & Viljoen, 1998; Zabora, Brintzenhofeszoc, Curbow, Hooker, & Piantadosi, 2001), as well as anxiety (Hamilton, 1999; Zabora et al., 2001), when they were diagnosed with cancer.

Furthermore, females were more likely to have depression than males in a sample of 121 patients with rectal cancer ($p < 0.03$) (Rauch et al., 2004). Younger patients with cancer reported higher distress compared to older patients, but the level of distress decreased as income increased (Zabora et al., 2001). Time since diagnosis had a significantly negative relationship with the levels of anxiety ($p = .014$) and depression ($p = .011$; Bisseling, Kondalsamy-Chennakesavan, Bekkers, Janda, & Obermair, 2009). Furthermore, Boscaglia, Clarke, Jobling, and Quinn (2005) suggested that younger age, late stage of disease, and greater use of negative religious coping were significant predictors of a high level of depression ($F(2, 90) = 11.54$, $R^2 = .28$, $p < .01$). Furthermore, females with an ostomy had higher depression ($p = .003$) and anxiety ($p = .002$) than females without an ostomy (Krouse et al., 2009). However, good communication was linked to low levels of depression (Ferroni & Taffe, 1997). As for sexual function, depression and anxiety had a negative impact on it (Bodurka & Sun, 2006; Carmack Taylor et al., 2004), and 46% of females with a sexual disorder in a sample of 105 females with gynecological cancer expressed that they suffered moderate to severe distress because of sexual problems (Corney et al., 1993). Moreover, younger females with gynecological cancer were more likely to report that personal and marital distress had an impact on their sexual dysfunction than older females (Corney et al., 1993).

In summary, females are more likely to report depression and anxiety than are males. In addition, research has found that patients experience depression and anxiety following cancer treatments; furthermore, the levels of anxiety and depression are associated with age, income, time since diagnosis, and presence of an ostomy.

Sexual Relationship Power and Female Sexual Function

Sexuality and power are two key concepts in feminism (Tong, 1989; Yoder & Kahn, 1992). Biological differences between men and women are assigned different social meanings and expectations, which results in the inequalities of gender-based power (Blanc, 2001). Radical feminists have expressed that women are always expected to be subordinate to men and that women always have less power than men in politics, economy, and society, except when the heterosexual relationships are egalitarian (Tong, 1989). Further, gender-based power inequalities have an impact on the quality of discussion or communication in sexual relationships (Blanc, 2001). However, power is ubiquitous (Pulerwitz et al., 2000), and the definition of power is diverse, complicated, multidetermined, and multileveled, such as intrapersonal, interpersonal, organizational, or societal (Brezsnyak & Whisman, 2004; Pulerwitz et al., 2000; Yoder & Kahn, 1992). In 1983, Gray-Little and Burks explained that such power is defined by the ability to cause intended effects in the relationship. Further, Yoder and Kahn (1992) defined the power in two different dimensions based on the feminist perspective: "power-over" refers to the ability to control or dominate others, and "power-to" refers to personal empowerment. However, Pulerwitz and co-investigators (2000) gave a different definition of relationship power, saying that it is the control of the relationship and dominance of decision making, and this definition was supported by Harvey et al. (2002), who conducted qualitative research to explore the definition of power in intimate relationships.

Relationship power has been demonstrated to be related to education level (Harvey et al., 2002; Ketchen et al., 2009; Pulerwitz et al., 2000, 2002), income

(Pulerwitz et al., 2002), depression (Halloran, 1998), sexual desire (Brezsnyak & Whisman, 2004), sexual dysfunction (Lau et al., 2006), and marital satisfaction (Whisman & Jacobson, 1990). Research has demonstrated that females with high education levels reported high relationship control and perceived their partners as having less dominance in decision making (Ketchen et al., 2009); this result was also supported by Pulerwitz et al. (2002). Moreover, females with a personal income that was greater than $25,000 or between $10,000 and 25,000 showed high relationship power compared to females with an income of less than $10,000 (Pulerwitz et al., 2002); Harvey et al. (2002) supported these results, saying that "economic independence," such as having a job and bringing in money, was related to females' power in relationships. However, age was not significantly related to relationship power (Pulerwitz et al., 2002). Regarding depression, Halloran (1998) explained that there is a bidirectional relationship between power inequality and depression, which means that females' depression might exacerbate any power disproportion in their relationships. Furthermore, nondistressed couples with greater power inequality tended to report less marital satisfaction (Whisman & Jacobson, 1990); in addition, higher levels of egalitarianism were significantly related to higher sexual desire for both males and females in the general population (Brezsnyak & Whisman, 2004). Lau and colleagues (2006), who conducted research with 298 randomly selected couples in China, found that the level of control in a relationship significantly predicted females' sexual dysfunction and sexual satisfaction. Moreover, females who felt attractive also had increased feelings of power (Harvey et al., 2002).

In summary, most research studies explored the variable of gender power or relationship power within the intimate relationship in general couples, and the results showed that power equality is associated with education level, income, employment status, depression, sexual function, sexual satisfaction, and attractiveness. However, only the rare study demonstrated the impact of relationship power on body image, depression and anxiety, female sexual function, and sexual satisfaction for gynecological and rectal cancer populations. Therefore, this research study will fill this gap.

Sexual Satisfaction and Female Sexual Function

Sexual satisfaction relies not only on physical and intrapersonal sexually interactive aspects but also on affective and interpersonal relationship aspects, especially for intimate relationships (Byers, 2001). Higher satisfaction in intimate relationships is associated with a satisfying sexual life (Byers, 2005; Guo & Hung, 2005; Sprecher, 2002) and sexual function (Dunn, Croft, & Hackett, 1999; Laumann, Paik, & Rosen, 1999). As for the relationships between sexual function and sexual satisfaction, Huang et al. (2009) suggested that sexual desire/interest had a significant relationship with sexual satisfaction in a sample of 1,977 females aged 45 to 80, and older females who were not sexually active had greater sexual satisfaction than younger females. Furthermore, Dundon and Rellini (2010) demonstrated that female sexual function—including desire ($r = .686$, $p < .001$), arousal ($r = .804$, $p < .001$), lubrication ($r = .666$, $p < .001$), orgasm ($r = .636$, $p < .001$), and pain ($r = .470$, $p < .001$)—was significantly related to overall sexual satisfaction among 86 females aged 40 to 70. Another current study showed that female

sexual function was strongly correlated with sexual satisfaction in a sample of 154 females aged 19 to 49 years who were in sexual relationships ($r = .69$, $p < .001$) (Pujols et al., 2010). Better communication between couples tended to help increase sexual satisfaction (MacNeil & Byers, 1997); people who are in a relationship can share intimate information related to sexuality (Byers, 2001) and better understand each other's sexual needs and preferences, which can promote their sexual satisfaction (Purnine & Carey, 1997). The high levels of sexual satisfaction predict the maintenance of marital stability (Yeh, Lorenz, & Wickrama, 2006).

Higher depression has been shown to be related to lower sexual satisfaction (Butzer & Campbell, 2008; Carmack Taylor et al., 2004), and females with poorer body image tended to have less sexual satisfaction (Calogero & Thompson, 2009; Carmack Taylor et al., 2004). The study of Dundon and Rellini (2010) demonstrated that feeling fat had a moderately negative relationship with the satisfaction of emotional closeness during sex ($r = –.297$, $p < .01$) and satisfaction with the sexual relationship ($r = –.245$, $p < .05$) and that feeling strong and fit ($r = .260$, $p < .05$) and feeling attractive ($r = –.269$, $p < .05$) were positively related to overall sexual satisfaction. Furthermore, Perlman and Abramson (1982) and MacNeil and Byers (1997) found that greater sexual function was related to higher sexual satisfaction among people who were in a relationship, and sexual intercourse is the most important variable in sexual satisfaction (Philippsohn & Hartmann, 2009). Being married, being Latina, and having psychological well-being were significant variables in predicting sexual satisfaction (Huang et al., 2009), and Dundon and Rellini (2010) suggested that demographics (including age and relationship

length), female sexual function (including desire, arousal, lubrication, orgasm, and pain) ($\triangle R^2 = .681$, $p < .001$), psychological well-being ($\triangle R^2 = .086$, $p < .01$), and menopausal symptoms ($\triangle R^2 = .034$, $p < .05$) significantly contributed to explaining the variance in overall sexual satisfaction. However, Ferenidou et al. (2008) had different results, showing that 72.5% of females in their study who had a sexual dysfunction, as determined by a score on the FSFI lower than 26.55, expressed that they were satisfied with their sexual function.

Physical symptoms, psychological status, menopausal symptoms, sexual function, and the adjustment of the relationship were predictors of sexual satisfaction (Carmack Taylor et al., 2004; Dundon & Rellini, 2010); in addition, demographic variables, including age, ethnicity, and education level, were also correlated with sexual satisfaction (Carmack Taylor et al., 2004; Ferenidou et al., 2008). Age had a negative relationship with sexual satisfaction in that females' sexual satisfaction decreases as their age increases (Ferenidou et al., 2008), and females with high education levels or who are non-Hispanic white had higher satisfaction (Carmack Taylor et al., 2004).

In summary, related studies have demonstrated that there is a positive relationship between sexual function and sexual satisfaction. Furthermore, age, relationship status, body image, mental health, menopausal symptoms, ethnic/racial backgrounds, and education levels are factors associated with sexual satisfaction.

Female Sexual Self-Schema

The individual characteristics of females that cause them to view themselves as sexual beings make up the female sexual self-schema (Andersen & Elliot, 1993)—the basic and core beliefs regarding one's sexual aspects (Cyranowski et al., 1999). The concept of female sexual self-schema has been defined by Andersen and Cyranowski (1994) as "cognitive generalizations about sexual aspects of oneself that are derived from past experience, manifest in current experience, influential in the processing of sexually relevant social information, and guide sexual behavior" (p. 1079). Personal differences of sexual self-schema compose a cognitive diathesis in a diathesis-stress model of sexual dysfunction (Cyranowski et al., 1999). Furthermore, the female sexual self-schema has been evaluated by using trait-adjective ratings on the Sexual Self-Schema Scales (Andersen & Cyranowski, 1994), and Andersen, Woods, and Copeland (1997) explained this construct as an individual difference concept that is used to predict a high risk of sexual dysfunction in females following cancer. Specifically, females' views of their self-schema include two positive aspects, "an inclination to experience romantic/passionate emotions and a behavioral openness to sexual experience," and a negative aspect, "embarrassment or conservatism" (Andersen & Does, 1994, p. 226), which may be a deterrent to sexual feelings and behaviors (Andersen & Cyranowski, 1994; Andersen & Does, 1994). Females who have a positive sexual self-schema give different descriptions of sexual thoughts, feelings, and activities than females with a negative sexual self-schema (Cyranowski, Aarestad, & Andersen, 1999).

Females with positive schemas have a positive attitude toward sexual expression, a high frequency of sexual activities, and low negative sexual effect, and they are willing to engage in their relationships with passionate love and secure romantic attachments (Andersen & Does, 1994; Carpenter et al., 2009), which facilitate sexual response (Cyranowski et al., 1999). Moreover, females with positive views are likely to cope resiliently with stressors regarding sexual changes (Carpenter et al., 2009). Conversely, females with negative or conflicted schema tend to have conservative and negative attitudes regarding sexual behaviors, low sexual desire and arousal, high sexual anxiety, a tendency to avoid sexual activities, anxiety about abandonment, and inhibitions in intimate relationships (Andersen & Does, 1994; Carpenter et al., 2009). Furthermore, females with negative views are potentially vulnerable to internalizing sexual dysfunctions in their attitudes that influence mood status, exacerbating sexual problems (Cyranowski et al., 1999; Carpenter et al., 2009) and leading them to infrequently engage in sexual activities (Andersen, 1999). Moreover, Andersen (1999) explained that people with positive self-schemas might feel more liberal about discussing their sexual difficulties and expressing their sexual needs with their partners, whereas people with negative sexual self-schemas would have a deficiency in sexual communications that would exacerbate the sexual problems within their relationships.

Sexual self-schema has been shown to be an important variable in predicting sexual behavior, responsiveness, and satisfaction (Andersen et al., 1997; Carpenter et al., 2009; Donovan et al., 2007; Yurek, Farrar, & Andersen, 2000) by using the Sexual Self-Schema Scale (Andersen & Cryanowski, 1994), and sexual self-schema acts as a

moderator between sexual satisfaction and psychological status (Carpenter et al., 2009). In a study with a sample of 135 females (61 females with gynecological cancer and 74 gynecologically healthy females), the researchers found that females with negative sexual self-schemas reported lower sexual desire, lower sexual excitement, disrupted orgasm, and disrupted resolution compared with females with positive sexual self-schemas (Andersen et al., 1997). Regarding body image, Reissing, Laliberte, and Davis (2005) found that its role had no relationship with sexual self-schema ($r = .14$, $p > .5$) among 84 females aged 18 to 29. However, better communication and greater sexual self-disclosure were associated with high levels of sexual satisfaction (MacNeil & Byers, 1997).

Andersen et al. (1997) used hierarchical multiple regression analysis to predict sexual response (the sum scores of desire, excitement, orgasm, resolution, and general) among females with gynecological cancer, and the results showed that sexual self-schema was the only significant predictor, adding 28% of the variance in sexual responsiveness, and the other predictors (previous frequency of sexual intercourse, extent of disease treatment, and menopausal symptoms) were less important, only explaining 6% of the variance. However, the entire model of sexual responsiveness accounted for 34% of the variance (Andersen et al., 1997). Further, as for sexual activity in females after breast cancer surgery, the factors of menopausal status, prior frequency of sexual intercourse, extent of treatment, and sexual self-schema were significant predictors that accounted for 32% of the variance in current sexual activity, and sexual self-schema added 3% of the variance for a total of 32% variance in current sexual activity (Yurek et al., 2000).

In addition, for females who underwent treatment for cervical cancer, Donovan et al. (2007) found that receipt of radiation ($r = .27$, $p < .05$), worse partner relationships ($r = –.32$, $p < .05$), worse perceived body appearance ($r = –.32$, $p < .05$), more negative sexual self-schema ($r = –.36$, $p < .05$), and more vaginal changes ($r = .58$, $p < .0001$) were significantly related to higher sexual dysfunction. Furthermore, the predictors of time since diagnosis (B = .14, $p < .01$), vaginal changes (B = –.54, $p < .0001$), partner relationships (B = .18, $p < .05$), sexual self-schema (B = .13, $p < .05$), and physical appearance (B = .13, $p < .5$) accounted for 53% of the variance in sexual satisfaction in 50 females with cervical cancer (Donovan et al., 2007). Moreover, a recent research study of gynecological cancer survivors demonstrated that sexual self-schema was significantly related to female sexual function after controlling for participant age, family income, and health status (including functional status, symptoms/signs, vaginal changes, and fatigue symptoms); and sexual self-schema also had a significant relationship with sexual satisfaction after controlling for family income, time since the diagnosis of cancer, functional status, fatigue symptoms, and partner sexual functioning (Carpenter et al., 2009). Carpenter et al. (2009) also suggested that sexual self-schema serves as a moderator, that it "buffered" females with gynecological cancer from depression as their sexual satisfaction was low (p. 835).

In summary, sexual self-schema in an individual's set of beliefs related to sexuality and has turned out to be the important predictor for sexual function and sexual satisfaction in many studies. Furthermore, sexual self-schema also serves as a moderator to buffer the association between psychological disorders and sexual satisfaction.

Summary

The results of the literature review related to sexuality and sexual function among females with gynecological cancer are clearer and more extensive compared with those related to females with rectal cancer, especially regarding the effects of sexual self-schema and sexual relationship power. However, the literature review is based on the conceptual framework described in Figure 1.1 and Figure 1.2 in Chapter 1. The surgery and treatments for rectal cancer and gynecological cancer contribute to body image changes, anxiety and depression, female sexual dysfunction, and sexual dissatisfaction, and there are relationships among body image, anxiety and depression, and sexual relationship power. Personal information (including demographic characteristics, health histories, and disease characteristics), body image, depression and anxiety, sexual relationship power, and sexual self-schema are predictors that help explain female sexual function and sexual satisfaction following rectal cancer and gynecological cancer. Furthermore, according to the related literature, the sexual self-schema serves as a moderator to buffer the relationships among body image and sexual function, anxiety and depression and sexual function, sexual relationship power and sexual function, body image and sexual satisfaction, anxiety and depression and sexual satisfaction, and sexual relationship power and sexual satisfaction. However, sexual self-schema may also be a mediator that affects these relationships, and it will be tested after the data collection is completed. Finally, females who have a good body image, low anxiety and depression, equality in sexual relationship power, and positive sexual self-schema will tend to report

better sexual function and sexual satisfaction after gynecological cancer and rectal cancer surgery and its related treatments.

Chapter 3: Methods

This chapter describes the methods used to conduct this study. It includes a description of the research design, sampling and setting, procedures for data collection, instrumentation, and data analysis methods according to the research questions.

Research Design

A retrospective and cross-sectional design was used in this study based on the study's time orientation, and this design is economical and appropriate. A retrospective design can be used to collect data related to past events and present outcomes at a single time point (Polit & Beck, 2008), and a cross-sectional design can be applied for exploring the relationships among variables in the conceptual framework that are supported by research evidence, logical reasoning, and a strong theoretical rationale at a fixed point in time (Polit & Beck).

Furthermore, according to the purpose of this study, a comparative and descriptive correlational design was justified in this investigation. A comparative design was applied to compare the differences in sexual function and sexual satisfaction between two groups: females who have experienced rectal cancer surgery or gynecological cancer surgery more than three months before the study, and females without any cancer. In addition to a comparative design, a descriptive correlational design was also used in this study to explore the relationships among body image, anxiety and depression, sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction in females with rectal cancer or gynecological cancer. Correlational research is often strong

in realism and an efficient way to collect a significant amount of data, including a large number of variables and samples, to explore a large number of interrelationships of interesting health problems in a relatively short time (Polit & Beck, 2008).

Sampling

Two groups were formed: females with rectal cancer or gynecological cancer and females without any cancer. Participants who had been diagnosed with rectal/gynecological cancer and fit the criteria were included in the sample of females with rectal/gynecological cancer. A second group of participants without any cancer who fit the criteria served as the comparison group for this study. Sixty-one participants with gynecological/rectal cancer and 91 participants without any cancer were recruited in this study.

The following were inclusion criteria for females with rectal cancer or gynecological cancer: they must be females; live in the United States or Canada; be 18 years or older; be in a relationship or married; read English; have experienced rectal cancer or gynecological cancer surgery more than three months ago; have no prior history of any other type of cancer; be finished with postoperative chemotherapy and radiotherapy; have had no postoperative complications after surgery and treatments, including wound infections, temporary bladder dysfunction, anastomosis leakage, bleeding, and ostomy complications; and be willing and able to provide information about the research questions. The inclusion criteria for females without cancer were the

following: they must be females, live in the United States or Canada, be 18 years or older, be married or in a relationship, read English, and not have a history of cancer.

Procedures for Data Collection

After gaining approval from the Institutional Review Board (IRB) of the University of Texas at Austin, the researcher started to recruit potential participants. The researcher made contact with a variety of Internet cancer support groups, cancer advocacy organizations, and health care groups to recruit potential participants with rectal cancer or gynecological cancer and with Internet groups or organizations for women to recruit healthy women for the comparison group. The purpose and procedures of the study were explained to the chairs or managers of these Internet support groups or organizations in asking for their help to announce the study through their groups or organizations to potential participants. Recruitment letters with the study announcement (see Appendix C) sent via e-mail or flyers/messages posted on websites or in newsletters of these health care organizations or support groups were used to announce the study after getting the approval or permission of the Internet organizations and groups. Furthermore, the four-step process, including sending a brief prenotice letter, a questionnaire package, a thank you/reminder letter, and a final contact letter, was conducted in accordance with Dillman, Smyth, and Christian's guidelines (2009).

The potential participants who were interested in the study contacted the investigator by e-mail or phone. The researcher introduced the study's purpose and procedures, informed the participants about the protection of confidentiality, and obtained

their permission to document their names and addresses. The study addressed sensitive issues and concerns; therefore, the researcher told participants about their right to refrain from responding to questions that made them feel uncomfortable.

Study packets were sent to potential participants' residences within one week of sending the brief prenotice letter (see Appendix D). Each packet contained a detailed cover letter introducing the purpose and procedures of the study and explaining the protection of confidentiality (see Appendix E); two informed consent forms for the participant (see Appendix F); a $5 cash incentive (initially $1) and a tea bag; a stamped postcard; the seven short questionnaires—Personal Information Survey, DSFI Body Image Scale for Women (BIS), Hospital Anxiety and Depression Scale (HADS), Sexual Relationship Power Scale (SRPS), Sexual Self-Schema–Women's Form (SSS), Female Sexual Function Index (FSFI), and Index of Sexual Satisfaction (ISS) (see Appendix G)—and a stamped, self-addressed envelope for easy return. The researcher put a prepaid postcard in the study packet that allowed the participants to return the postcard separately from the questionnaires to indicate that the questionnaires had been returned if the participants wished not to be identified in their responses (Dillman et al., 2009).

The seven questionnaires were labeled with continuous code numbers, and a list of code numbers was used instead of participants' names and addresses to protect their privacy and maintain confidentiality. Four weeks after the study packet was mailed, a letter was sent to all participants to serve as a reminder (see Appendix H) for those who had not returned their packets or as a thank you (see Appendix I) to those who had

(Dillman et al., 2009). Finally, after six weeks, a follow-up letter (see Appendix J) was sent as a final contact to those who had not yet returned the questionnaires.

To provide privacy and confidentiality for participants when discussing this sensitive topic**,** all information and data were kept in a secure file in the researcher's personal computer, which was password protected. The password was known only by the researcher. In addition, the paper files were put in the locked drawer under the personal computer, and the key was kept only by the researcher. The researcher reviewed the data alone, no additional people were able to access the file, and the data were read and used only for research purposes by the researcher. The list linking participants' names and addresses to code numbers was destroyed after the data analysis was completed.

Instrumentation

Seven instruments were utilized for this study after obtaining authors' permissions, including (1) a personal information survey to gather demographic characteristics, health histories, and disease characteristics ; (2) DSFI Body Image Scale for Women to measure the perception of body image; (3) Hospital Anxiety and Depression Scale to examine mood disorders; (4) Sexual Relationship Power Scale to explore power in the intimate relationship; (5) Sexual Self-Schema Scale to detect personal perspectives toward sexuality; (6) Female Sexual Function Index to investigate female sexual function related to female sexual responses; and (7) Index of Sexual Satisfaction to examine the satisfaction of the sexual relationship with the partner. A

summary of the study variables and instruments used is shown in Table 3.1, and each instrument is described in detail.

Table 3.1 Study Variables and Related Instruments

Variables	Instruments	Subscales	Cronbach's α	Items
Personal Information	Personal Information	Demographic Characteristics		11
		Health Histories		4
		Disease Characteristics		8
Body Image	Body Image Scale (BIS)		.58–.84	15
Psychological Status	Hospital Anxiety and Depression Scale (HADS)	Anxiety	.83–.93	7
		Depression	.83–.90	7
Sexual Relationship Power	The Modified Sexual Relationship Power Scale (SRPS-M)	Relationship Control	.84	12
		Decision-Making Dominance	.60	7
Sexual Self-Schema	Sexual Self-Schema Scale for Women (SSS)	Passionate/Romantic Open/Direct Embarrassed/Conservative	.82	26
Female Sexual Function	Female Sexual Function Index (FSFI)	Desire		2
		Arousal		4
		Lubrication		4
		Orgasm		3
		Satisfaction		3
		Pain	.93–.97	3
Sexual Satisfaction	Index of Sexual Satisfaction (ISS)		.91–.93	25
			Total items	141

Personal Information Survey

The personal information survey was developed by the researcher for this study and includes two parts: demographic characteristics and disease characteristics.

Demographic characteristics. This part gathered personal information such as the participant's age, education level, ethnicity, race, employment status, personal income from the previous year, marital status, gender of current partner, length of time with the current partner, the partner's age, and number of children.

Health histories. Health histories included menopausal status, hormone replacement therapy (HRT) use, past medical history (diabetes or hypertension), and presence of sexual problems before the surgery.

Disease characteristics. Disease information included cancer type, time since surgical operation, cancer stage, recurrent or not, receiving hospice care, type of treatment received (surgery, radiotherapy, chemotherapy, or preoperative radiotherapy), presence of a stoma, and ECOG performance status.

DSFI Body Image Scale for Women

Development. Self-esteem is promoted by self-image, which is related to the ability to love and be loved, and sexual relationships are important vehicles in expressing love and affection (Derogatis & Melisaratos, 1979). Derogatis and Melisaratos found that one of the most common barriers for achieving a conducive situation in sexual relationships is physical self-deprecation or poor body image. Body image is significantly altered by congenital defects, surgical interventions, pelvic exenteration, trauma, and

spinal injury, and these changes induce alterations of self-esteem and set up a difficult readjustment (Derogatis & Melisaratos). Body image is developed at an early time and relies heavily on others' reflected evaluations of one's beauty (Derogatis & Melisaratos). The DSFI Body Image Scale, designed to reflect the participants' degree of personal appreciation of their own bodies, is one of 10 subscales on the Derogatis Sexual Functioning Inventory (DSFI), and a single body image score was calculated (Derogatis, 1998).

Scoring. The Body Image Scale consists of 15 items: 10 general body attributes that are the same for both sexes and 5 gender-specific items for genital attributes. Each item is a 5-point item scored from 0 (not at all true of me) to 4 (extremely true of me). High scores indicate a low degree of appreciation of the participants' bodies, and some items have to be reverse scored to maintain the alignment of high scores to the participants' low degree of personal appreciation of their bodies.

Reliability and validity. The internal consistency reliability of the Body Image Scale was a bit lower than expected (coefficient alpha = .58) for the sample of 325 participants, including females and males (Derogatis & Melisaratos, 1979); however, Derogatis and Melisaratos explained that the reason for this is that the Body Image Scale has two subsets of items reflecting two distinct aspects of body image to some degree. However, Trapnell, Meston, and Gorzalka (1997), when using this scale with 437 female students to explore the relationship between body image and sexual experience, found the Cronbach's alpha of the DSFI Body Image Scale to be .84, and Andersen and Legrand (1991) supported this conclusion that the DSFI Body Image Scale has good reliability

(.71) for the gynecological disease group. For discriminant validity, the study using the DSFI Body Image Scale to distinguish the body images of females with sexual dysfunctions from those of females without sexual dysfunctions showed that there were significant differences between these two groups ($p < .01$) (Derogatis & Melisaratos). Therefore, the DSFI Body Image Scale was a reliable and valid instrument to be used in this study to explore the degree of body image satisfaction after rectal cancer and gynecological cancer.

Hospital Anxiety and Depression Scale

Development. The Hospital Anxiety and Depression (HAD) Scale is a self-reporting scale developed by Zigmond and Snaith (1983). The impetus for developing this scale was the need for a short, self-reporting mood scale to be used in nonpsychiatric hospital departments to detect a disorder in a short time (Zigmond & Snaith), and anxiety and depression were chosen in this mood scale since these two aspects of neurosis are the most commonly presented in hospitals (Zigmond & Snaith). In order to define and distinguish the concepts of anxiety and depression, items in the subscale of depression were based on the anhedonic state, and items within the subscale of anxiety were chosen from two studies related to the measurement of psychiatric symptoms (Wing, Cooper, & Sartorius, 1974) and the development of the Clinical Anxiety Scale (Snaith, Baugh, Clayden, Hussain, & Sipple, 1982) to manifest anxiety neurosis (Zigmond & Snaith).

Scoring. The HAD scale consists of 14 items, 7 of which assess anxiety (HADS-A) and 7 of which assess depression (HADS-D). Each item is a 4-point item scored from

0 (no symptoms) to 3 (maximum impairment), and the total score of each subscale is between 0 and 21. Cutoff points of both subscales for detecting normal, possible, and probable cases of anxiety and depression disorders were 0–7, 8–10, and 11–21, respectively (Zigmond & Snaith, 1983).

Reliability and validity. Regarding internal consistency, the Cronbach's alpha coefficient for cancer, psychiatric, medical, and normal populations varies from .83 to .93 for the subscale of anxiety and from .83 to .90 for the subscale of depression (Bedford, Pauw, & Grant, 1997; Dagnan, Chadwick, & Trower, 2000; Moorey et al., 1991). Regarding the validity of the scale, studies using principal component factor analysis demonstrated two factor structures for the HAD scale in accordance with the two subscales of anxiety and depression (Bedford et al., 1997; Dagnan et al., 2000; Moorey et al., 1991). The Pearson correlation coefficient between HADS-A and the State-Trait Anxiety Inventory (STAI) was .78 ($p < .0001$), showing an excellent convergent validity of HADS-A for the sample of 145 HIV-infected patients (Savard, Laberge, Gauthier, Ivers, & Bergeron, 1998), and a high, significant correlation of .70 ($p < .0001$) was obtained between HADS-D and the Beck Depression Inventory (BDI), showing that HADS-D has a good convergent validity (Savard et al., 1998). However, HADS had a weak divergent validity because the correlation coefficients between HADS-A and BDI, between HADS-D and STAI, and between HADS-A and HADS-D were .68 ($p < .0001$), .65 ($p < .0001$), and .63 ($p < .0001$), respectively (Savard et al., 1998).

The HADS has been considered a reliable and valid instrument for assessing anxiety and depression in cancer, primary care, psychiatric, and general populations, and

it has been translated into different languages, including Swedish, English, Italian, German, Spanish, Dutch, Chinese, Portuguese, and Arabic (Bjelland, Dahl, Haug, & Neckelmann, 2002) even though the study showed that HADS has a weak divergent validity (Savard et al., 1998).

Sexual Relationship Power Scale

Development. The Sexual Relationship Power Scale (SRPS) was developed by Pulerwitz, Gormaker, and DeJong in 2000 to assess power in intimate relationships. The scale was derived from the theory of gender and power and the social exchange theory to demonstrate the inequalities of the gender-based structure in social backgrounds (Pulerwitz et al., 2000). Further, relationship control and decision-making dominance are two major conceptual dimensions to be addressed in this scale (Pulerwitz et al.). The original scale had 23 items, including 4 items related to condom use, to explore the consistency of condom use and sexual relationship power (Pulerwitz et al.). However, the modified scale, which does not have the condom-related items and is called the modified Sexual Relationship Power Scale (SRPS-M), was also available (Pulerwitz et al.) and was also used in this study in accordance with the study's research purpose. The scale and its subscales have been used in other studies to explore the relationships among sexual relationship power, condom use, sexual decision making, stressful life events, sexual dysfunction, and sexual satisfaction in general populations (Ketchen et al., 2009; Lau et al., 2006; Pulerwitz et al., 2002).

Scoring. The modified scale is composed of two domains: relationship control (12 items) and decision-making dominance (7 items). The relationship control subscale is scored by a 4-point Likert scale (from 1 = strongly agree to 4 = strongly disagree), and the decision-making dominance subscale includes the choices of 1 = your partner, 2 = both of you equally, and 3 = you. High scores represent high sexual relationship power.

Reliability and validity. The Cronbach's alpha of internal consistency was .85 for the SRPS-M scale, .84 for the modified relationship control subscale, and .60 for the modified decision-making dominance subscale in the population of 380 general women (Pulerwitz et al., 2000). For the construct validity, the factor analysis of the original SRPS represented two factors: the relationship control factor accounted for 67% of the variation, and the decision-making dominance factor explained 19%. Further, the SRPS without the four items related to condom use was also significantly associated with the consistency of condom use ($p < .05$) in the general population of women (Pulerwitz et al.).

The SRPS-M had shown good validity and reliability (Pulerwitz et al., 2000). However, the modified scale, which had not been used in any cancer populations, was used for not only general female populations but also gynecological and rectal cancer populations in this study. Therefore, the internal consistency of the two subscales and the total SRPS-M were calculated using Cronbach's alpha in this study.

Sexual Self-Schema Scale–Women's Form

Development. Sexual function and psychological status are influenced by specific medical factors (Andersen, 1993; Andersen & Elliot, 1993), and identifying who is at the greatest risk for sexual problems is important. Furthermore, Andersen and Elliot (1993) found that "a woman's view of herself as a sexual person" is more of a central perspective than a female's view of her own body to predict sexuality (p. 165). Sexual self-schema illustrates not only the sexual intrapersonal domain but also interpersonal relationships (Andersen & Cryanowski, 1994). A sexual self-schema should be not only a representation of sexual history but also a function with which to gain information so that a woman can judge, decide on, infer, and predict her current and future self and her behavior (Andersen & Cryanowski). Furthermore, Andersen and Cryanowski hypothesized that females have two different sexual self-schemas, including positive and negative views, and conducted six studies to define the construct and describe the validation of the scale. A female with a positive self-schema is predicted to be more willing to enter sexual relationships, to exhibit positive emotions in the relationships, and to demonstrate a behavioral repertoire (Andersen & Cryanowski); on the contrary, a female with a negative sexual schema is predicted to have less sexual experience, negative affects for sexual matters, a dislike for entering intimate relationships, and feelings of being uncomfortable and unskilled in sexual activities (Andersen & Cryanowski).

Scoring. The scale has 26 trait adjectives (with 24 filler items) that are self-rated from 0 (not at all descriptive of me) to 6 (very much descriptive of me). The factor

analysis of the Sexual Self-Schema Scale for women showed a three-factor solution. The factors were labeled as follows: (1) Passionate-Romantic factor, including 10 items; (2) Open-Direct factor, including 9 items; and (3) Embarrassed-Conservative factor, including 7 items (Andersen & Cryanowski, 1994). The score of the Sexual Self-Schema Scale is calculated by summing the values of the items for factor 1 and factor 2 and then subtracting the values of the factor 3 items, ranging from –42 to 102. Lower scores represent a more negative sexual self-schema, and higher scores reflect a more positive self-schema.

Reliability and validity. The Cronbach's alpha values of the internal consistency were .82 for the full Sexual Self-Schema Scale, .81 for factor 1, .77 for factor 2, and .66 for factor 3 using the study of 387 female undergraduates (Andersen & Cryanowski, 1994). Carpenter and colleagues (2009) have also demonstrated that the coefficient alpha of the SSS was .76 for the study of gynecological cancer survivors. Further, Pearson coefficients of the test-retest for the full SSS were .89 ($p < .0001$) and 0.88 ($p < .0001$) for 2-week and 9-week intervals, respectively (Andersen & Cryanowski), which demonstrated the stability of the scale.

Convergent validity from a sample of 220 undergraduate females showed that factor 1 had the strongest relationships with sexual arousal, romantic relationships, and the number of times that participants had fallen in love; factor 2 demonstrated the strongest associations with sexual behaviors, love relationships, and positive attitudes toward sex without commitment; and factor 3 had inverse relationships with sexual behaviors, sexual arousal, love relationships, and attitudes toward casual sex and sex

without commitment (Andersen & Cryanowski, 1994). Discriminant validity indicated that a positive sexual self-schema is different from extroversion and good self-esteem and that it increased incremental variance significantly in predicting lifetime sexual activities, rating of oneself as a sexual woman, and sexual arousal (Andersen & Cryanowski). Therefore, good convergent validity and discriminant validity supported the internal validity of the SSS for women.

Female Sexual Function Index

Development. The most valid way to estimate female sexual function is in a naturalistic setting, although several laboratory-based physiological indices of female sexual response are available, such as vaginal blood flow (Rosen et al., 2000). The self-reporting measure is the only way currently available to assess female sexual response in an at-home setting (Rosen et al.). The investigator considered, first, the suggestions from an international, multidisciplinary consensus development conference that determined that there are four major dimensions of female sexual dysfunction, including desire disorders, arousal disorders, orgasmic disorders, and sexual pain disorders (Rosen et al) and, second, that sexual satisfaction is an important dimension that needs to be considered in female sexual function (Rosen et al.).

Scoring. The Female Sexual Function Index (FSFI) is a 19-item multidimensional self-reporting instrument designed to measure female sexual function in six domains: desire (2 items), arousal (4 items), lubrication (4 items), orgasm (3 items), satisfaction (3 items), and pain (3 items), over the 4 weeks preceding the instrument's application

(Rosen et al., 2000). Each item is scored with a 5-point (from 1 to 5) or 6-point (from 0 to 5) Likert-type scale, with the higher scores indicating better sexual function and the 0 score indicating no sexual activity during the previous 4 weeks (Rosen et al). The maximum score of each domain is 6.0, and the range of a full-scale score is from 2.0 to 36.0, determined by adding the six domain scores (Rosen et al). The optimal cutoff on the total FSFI score is 26.55 for differentiating between females with and those without sexual dysfunction, with a total score of 26.55 or lower indicating sexual dysfunction and a score of greater than 26.55 indicating a functionally normal sexual function (Wiegel, Meston, & Rosen, 2005).

Reliability and validity. The Cronbach's alpha coefficient of internal consistency for the FSFI total score and for each subscale varied from .91 to .97 for total score, from .84 to .92 for the desire domain, from .91 to .95 for the arousal domain, from .94 to .96 for the lubrication domain, from .90 to .94 for the orgasm domain, from .79 to .89 for the satisfaction domain, and from .93 to .95 for the pain domain among three different sample groups, including the sample of 259 participants (128 females with sexual arousal disorder and 131 normal controls), the sample of 283 females with sexual dysfunction, and the sample of 71 females with orgasmic disorder (Meston, 2003; Rosen et al., 2000; Wiegel et al., 2005). Carpenter and colleagues (2009) have also shown that coefficient alphas ranged from .89 to .96 for the subscales, and the alpha for the total score was .97 for the study exploring sexuality in females with gynecological cancer. Furthermore, the Pearson correlation coefficient between the scores for visits 1 and 2 showed that the total scale (r = .88) and all of the domains (r = .79–.86) had high test-retest reliability for the

full sample (128 females with sexual arousal disorder and 131 normal controls) in the original Rosen et al. (2000) study.

According to the results of the factor analysis of this 19-item questionnaire, the authors found a five-factor solution (Rosen et al., 2000), including desire/arousal, lubrication, orgasm, satisfaction, and sexual pain, and finally the items were divided into six domains, including desire, arousal, lubrication, orgasm, satisfaction, and sexual pain, because of clinical considerations (Rosen et al). Furthermore, the result of a five-factor structure was duplicated by another study using principal components analysis with varimax rotation (Wiegel et al., 2005). The significant differences between the means of females with female sexual arousal disorder (FSAD) and females in the comparison group were obtained for all domains and for the total scale score, showing that the FSFI total scale and subscales had good discriminant validity (Rosen et al., 2000), as did the discriminant validity testing of FSFI in Wiegel et al.'s (2005) study. Furthermore, the FSFI also had good divergent validity. Because the relationship between the FSFI score and the Locke-Wallace Marital Adjustment test score was computed by Pearson coefficient to test divergent validity, the results showed that the relationships between these two different instruments were very low for the FSAD group (r = .22) and low to moderate for the comparison group (r = .53) (Rosen et al).

The FSFI was a reliable and valid questionnaire for measuring sexual response and sexual function in females with sexual disorders and females without any sexual dysfunction. Therefore, this study used this instrument to explore female sexual function in females with rectal/gynecological cancer and in females without any cancer.

Index of Sexual Satisfaction

Development. Hudson, Harrison, and Crosscup (1981) found that several instruments related to sexual satisfaction evaluated only the satisfaction with sexual activities without measuring the satisfaction with a dyadic relationship and that the instruments were too long, complicated, and time consuming (Hudson et al.). Therefore, the Index of Sexual Satisfaction (ISS) was developed to assess the degree of sexual dissatisfaction of one's relationship with a partner. Furthermore, the ISS was designed to be used and scored easily in repeated administrations for researchers and therapists (Hudson et al.). All 25 items in the ISS were developed on the basis of clinical and personal experiences and reflected the common complaints from patients with dissatisfaction in their sexual relationships (Hudson et al.).

Scoring. The ISS is a 25-item self-reporting questionnaire designed to assess the degree of sexual satisfaction with a partner in a relationship (Hudson et al., 1981). Nineteen of the 25 items are directly related to the quality of the sexual relationship, and the remaining 6 items address positive or negative consequences of the quality of the sexual relationship (Hudson et al.). Items are scored on a 7-point Likert-type scale ranging from 1 (none of the time) to 7 (all of the time), and a higher score represents greater dissatisfaction with the sexual relationship (Walmyr Publishing Co., 1997). Before scoring the ISS, 12 items (items 1, 2, 3, 9, 10, 12, 16, 17, 19, 21, 22, and 23) of the 25 need to be reverse-scored, and then the total score can be computed by using the equation ($S = (\Sigma Y - N)(100)/[(N)(6)]$), where Y = an item score and N = the total number of items completed by the participant (Hudson et al., 1981). Through this scoring

procedure, the range of the total score on the scale is from 0 to 100, even if the participant neglects to complete one or more items (Hudson et al.). Moreover, the ISS has a clinical cutoff point of 30 to discriminate between clinical sexual problems, and this cutoff point correctly classified 92.2% of participants without any sexual problems, 79.6% of those with sexual problems, and 86.0% of the total clinical survey participants (Hudson et al.).

Reliability and validity. The Cronbach's alpha of reliability of the ISS varied from .91 to .93 for three different sample groups, including the first sample consisting of 378 participants from a multiethnic population (α = .925), the second sample consisting of 689 participants who voluntarily joined in the survey (α = .906), and the third sample consisting of 100 participants who were searching for counseling services for relationship problems (α = .916; Hudson et al., 1981). The test-retest reliability of the ISS was .93 for 79 graduate students on two occasions with a one-week interval (Hudson et al.). Furthermore, the ISS had good discriminant validity because it significantly discriminated between the mean scores of the ISS for the sexual-problem group and for the no-problem group (p < .001; Hudson et al.).

The ISS has shown good reliability and validity; however, the scale was rarely used in cancer populations. Therefore, this study not only used the ISS to explore the quality of sexual relationships for females with rectal/gynecological cancer and females without any cancer but also tested its reliability and validity in these specific populations.

Data Analysis

Data obtained from the personal information, DSFI Body Image Scale for Women, Hospital Anxiety and Depression Scale, Sexual Relationship Power Scale, Sexual Self-Schema Scale for Women, Female Sexual Function Index, and Index of Sexual Satisfaction were analyzed using SPSS (Statistical Package for Social Sciences, version 16.0 for Windows). Data analyses were guided by the research questions.

The significance level (α) is set at .05; however, to adjust the total Type I error rate across different tests, the significance level (α) is set at .05 subtracting inflation (α = .05 – inflation) to determine whether the correlations and regression analyses between study variables achieve significant differences. Mean substitution was not used to deal with missing data. The cases with missing data were excluded from the analyses.

Demographic characteristics, health histories, and disease characteristics were described with the use of frequency, central tendency, and other appropriate descriptive statistics. The scores of the six scales—BIS, HADS, SRPS-M, SSS, FSFI, and ISS—were analyzed using frequencies, the proportion of responses, and other appropriate descriptive statistics. ANCOVA was used to detect the differences in the independent variables of body image, anxiety and depression, sexual relationship power, and sexual self-schema between the means of the study and comparison groups by controlling the covariate of age. In addition, the reliabilities of the major study scales and their subscales were estimated by achieving a Cronbach's alpha of .70 or greater.

During the processes of collecting quantitative data, 26 participants with gynecological or rectal cancer added qualitative comments in the margins of the

questionnaires or sent e-mails, notes, or letters describing their experiences. These comments and experiences were obviously important to the participants. The purpose of the qualitative data analysis was to understand what the participants wrote in their unsolicited comments.

Content analysis was used in this study, which is suited to analyzing data on sensitive issues in nursing (Elo & Kyngas, 2008). The three major phases of the content analysis noted by Elo and Kyngas include preparing, organizing, and reporting. Before analyzing the data, the transcript was read at least five times to get a whole picture of the data, and line-by-line coding was used on the hard copy of the transcript. Microsoft Excel was used in this study to analyze and organize the data. After coding the meaningful units, the categories were derived as patterns emerged. The categories were merged into the themes, and the qualitative results are reported in the additional analysis in Chapter 4. The research questions were analyzed as follows.

Question 1: Are there relationships among demographic characteristics, health histories, and disease characteristics with respect to (a) body image, (b) anxiety and depression, (c) sexual relationship power, (d) female sexual function, and (e) sexual satisfaction?

Pearson correlations were computed for the significant relationships among the variables of demographic characteristics, health histories, disease characteristics, BIS scores, HADS scores, SRPS scores, SSS scores, FSFI scores, and ISS scores.

Question 2: What is the relationship among body image, psychological status (anxiety and depression), sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction?

Pearson correlations were computed for each relationship among these variable scales—BIS, HADS, SRPS, SSS, FSFI, and ISS—and these relationships were tested for significance.

Question 3: Does female sexual self-schema moderate (or mediate) the effects of body image, psychological status (anxiety and depression), and sexual relationship power on female sexual function and sexual satisfaction?

The hierarchical multiple linear regression (HMLR) was utilized to analyze these relationships. In this method, known predictor variables were entered first, and then the researcher added any new predictors into the model to predict the outcome (Field, 2005). Only those variables of the personal characteristics significantly correlated with the outcomes variables of sexual function and sexual satisfaction were entered in the respective HMLR model. Categorical variables were dummy coded before being entered into the model. R^2 was used to explain how much variance in the dependent variable was accounted for by the model, and the significance of *b*-weight was also used to evaluate whether the predictor variables contributed to the significant variance accounted for in the dependent variable (Munro, 2005).

First, HMLR analysis tested the contribution of sexual self-schema to the outcomes of sexual function. Variables were entered as (1) demographic characteristics, health histories, and disease characteristics; (2) body image, anxiety and depression, and

sexual relationship power; and (3) sexual self-schema. The final model examined the association of sexual self-schema with each outcome, beyond the contribution of controlling other variables. Furthermore, HMLR analysis checked not only the contribution of sexual self-schema but also the contribution of sexual function to the outcome variable of sexual satisfaction. Variables were entered as (1) demographic characteristics, health histories, and disease characteristics; (2) body image, anxiety and depression, and sexual relationship power; (3) sexual self-schema; and (4) sexual function.

Second, sexual self-schema was tested as a moderator of the effects of body image on the outcomes: sexual function and sexual satisfaction. Variables were entered as (1) demographic characteristics, health histories, and disease characteristics; (2) anxiety and depression and sexual relationship power; (3) body image; (4) sexual self-schema; and (5) the interaction term body image × sexual self-schema. However, the interaction term was calculated as the cross product of mean-centered variables of body image and sexual self-schema (Cohen, Cohen, West, & Aiken, 2003).

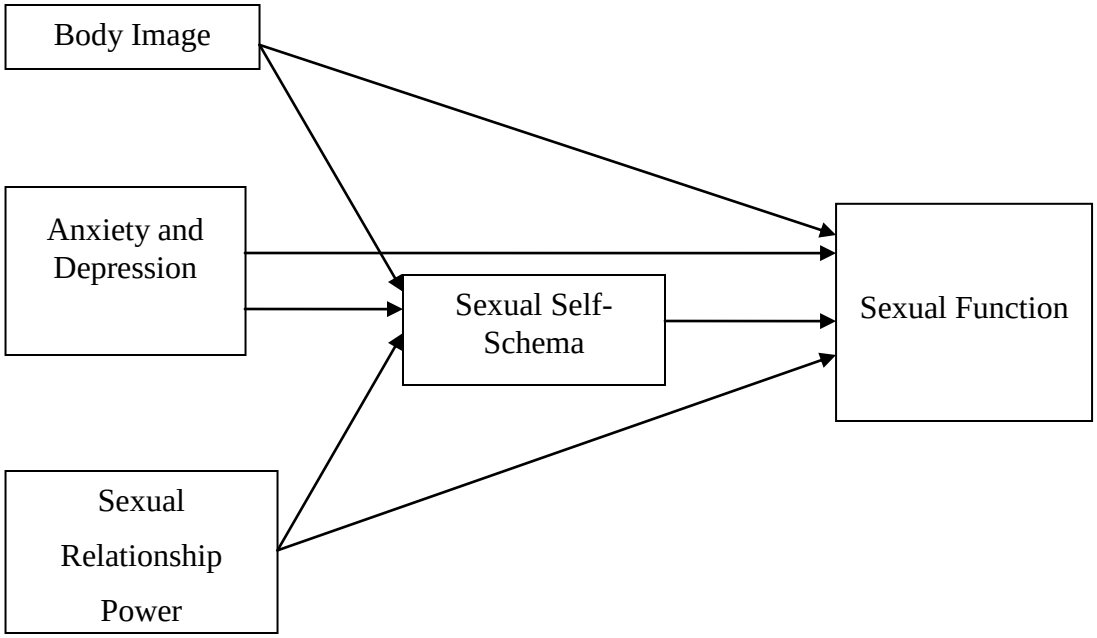
Third, sexual self-schema was tested as a moderator of the effects of anxiety and depression on the outcomes: sexual function and sexual satisfaction. Variables were entered as (1) demographic characteristics, health histories, and disease characteristics; (2) body image and sexual relationship power; (3) anxiety and depression; (4) sexual self-schema; and (5) the interaction term anxiety and depression × sexual self-schema. However, the interaction term was calculated as the cross product of mean-centered variables of anxiety and depression and sexual self-schema (Cohen et al., 2003).

Fourth, sexual self-schema was tested as a moderator of the effects of sexual relationship power on the outcomes: sexual function and sexual satisfaction. Variables were entered as (1) demographic characteristics, health histories, and disease characteristics; (2) body image and depression and anxiety; (3) sexual relationship power; (4) sexual self-schema; and (5) the interaction term sexual relationship power × sexual self-schema. However, the interaction term was calculated as the cross product of mean-centered variables of sexual relationship power and sexual self-schema (Cohen et al., 2003).

Path analysis using multiple regression analysis (Baron & Kenny, 1986) was conducted to explore sexual self-schema as a mediator to explain the strength that the sexual self-schema accounted for in the relationships among the variables of body image, anxiety and depression, sexual relationship power, and the dependent variable of sexual function (Figure 3.1). Two separate, simultaneous multiple regressions were performed. In the first regression, sexual function was regressed on body image, anxiety and depression, sexual relationship power, and sexual self-schema. For the path analysis, R^2 was the amount of variance in sexual function accounted for by the four predictor variables (body image, anxiety and depression, sexual relationship power, and sexual self-schema). In addition, the standardized beta coefficients with their respective *t*-tests and significance levels for each independent variable based on an alpha level of .05 were estimated to evaluate the unique contribution to sexual function. The second regression required sexual self-schema to be regressed on body image, anxiety and depression, and sexual relationship power. R^2 was the amount of variance in sexual self-schema

accounted for by the three predictor variables (body image, anxiety and depression, and sexual relationship power). The standardized beta coefficients with their respective *t*-tests and significance levels for these three independent variables based on an alpha level of .05 were estimated to evaluate the unique contribution to sexual self-schema. In addition, the Sobel test (Dudley, Benuzillo, & Carrico, 2004; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) was employed to further explore whether the mediator variable (sexual self-schema) significantly influenced independent variables (body image, anxiety and depression, and sexual relationship power) or the dependent variable (female sexual function), and a Sobel test calculator was used to calculate the results of Sobel tests (Soper, 2011; Sobel, 1982).

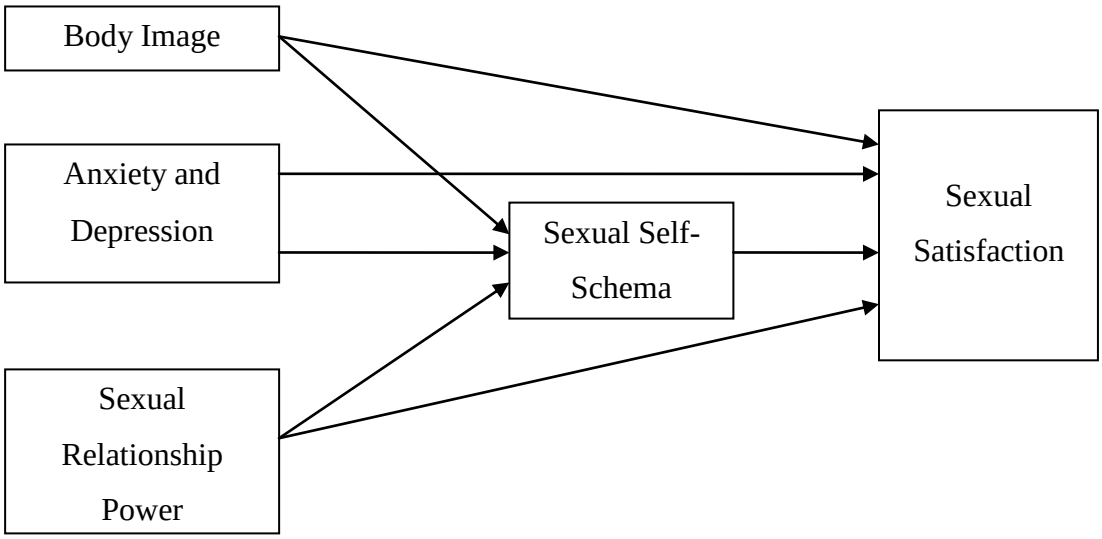
Figure 3.1 Sexual Self-Schema as a Mediator in Sexual Function



Further, sexual self-schema was explored as a mediator to explain the strength that it accounted for in the relationships among the variables of body image, anxiety and depression, sexual relationship power, and the dependent variables of sexual satisfaction (Figure 3.2). Two separate, simultaneous multiple regressions were performed. In the first regression, sexual satisfaction was regressed on body image, anxiety and depression, sexual relationship power, and sexual self-schema. R^2 was the amount of variance in sexual satisfaction accounted for by the four predictor variables (body image, anxiety and depression, sexual relationship power, and sexual self-schema). The standardized beta coefficients with their respective *t*-tests and significance levels for each independent variable based on an alpha level of .05 were estimated to evaluate the unique contribution to sexual satisfaction. The second regression required sexual self-schema to be regressed

on body image, anxiety and depression, and sexual relationship power. R^2 was the amount of variance in sexual self-schema accounted for by the three predictor variables (body image, anxiety and depression, and sexual relationship power). The standardized beta coefficients with their respective *t*-tests and significance levels for these three independent variables based on an alpha level of .05 were estimated to evaluate the unique contribution to sexual self-schema. Further, the Sobel test (Dudley et al., 2004; MacKinnon et al., 2002) was used to test whether the mediator (sexual self-schema) had a significant impact of independent variables (body image, anxiety and depression, and sexual relationship power) or the dependent variable (sexual satisfaction), and the results of Sobel tests were calculated using a Sobel test calculator (Soper, 2011; Sobel, 1982).

Figure 3.2 Sexual Self-Schema as a Mediator in Sexual Satisfaction



Question 4: What are the differences in female sexual function and sexual dissatisfaction between females with rectal/gynecological cancer and females without any cancer?

The dependent variables of sexual function and sexual satisfaction had correlations among one another. Therefore, two-group MANOVA was utilized to test each hypothesis and to test for significance. This method can be more powerful than ANOVA in detecting significant effects by describing the correlations between dependent variables in two groups (Meyers, Gamst, & Guarino, 2006). Further, following a significant overall multivariate result, the post hoc procedure used Wilks' lambda to determine the significant pairwise multivariate differences and then used univariate *t*-tests to determine which variables contributed to the significant pairwise multivariate differences (Stevens, 2009). However, sexual dysfunction is an age-related problem, and age may be a covariance if there is a significant linear relationship among age and sexual function and sexual satisfaction in the study. Therefore, MANCOVA would be considered instead of MANOVA to eliminate systematic bias and reduce error variance (Stevens, 2009).

Summary

This study used a comparative and descriptive correlational design to explore the differences in sexual function and sexual satisfaction among females with rectal/gynecological cancer and those without any cancer and to assess the effects of personal characteristics, body image, anxiety and depression, sexual relationship power, and sexual self-schema on female sexual function and sexual satisfaction. The participants were recruited from Internet cancer support groups and women's health communities. After gaining informed consent from participants, seven instruments were used to collect quantitative data, and these data were analyzed based on research questions using descriptive statistics, exploratory inference statistics, Pearson correlations, multiple linear regression analysis, Sobel test, ANCOVA, and MANCOVA. In addition, unsolicited qualitative data were also analyzed using qualitative content analysis to understand the experiences and comments of the participants with gynecological/rectal cancer.

Chapter 4: Findings

This chapter presents the findings of the study, including the descriptive statistics for the major study variables, and answers the research questions. Quantitative survey data were collected to explore the differences in sexual function and sexual satisfaction between women with rectal and/or gynecological cancer and women without any cancer and to assess the effects of personal characteristics, body image, anxiety and depression, sexual relationship power, and sexual self-schema on female sexual function and sexual satisfaction. The research questions of the study are as follows:

1. Are there relationships among demographic characteristics, health histories, and disease characteristics with respect to (a) body image, (b) anxiety and depression, (c) sexual relationship power, (d) female sexual function, and (e) sexual satisfaction?
2. What is the relationship among body image, psychological status (anxiety and depression), sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction?
3. Does female sexual self-schema moderate (or mediate) the effects of body image, psychological status (anxiety and depression), and sexual relationship power on female sexual function and sexual satisfaction?
4. What are the differences in female sexual function and sexual satisfaction between females with rectal/gynecological cancer and females without any cancer?

Demographic Characteristics and Health Histories

Of the 61 women with gynecological/rectal cancer (the study group) who were mailed questionnaires, 56 responded, but 1 of those didn't return the required consent sheet (90% usable response rate). Out of the 91 women without cancer to whom questionnaires were mailed (the comparison group), 72 responded (79% response rate). The demographic characteristics for the 55 participants in the study group and 72 participants in the comparison group are discussed in this section.

The age of the participants varied from 25 to 70 years with a mean of 52.73 for the study group and 21 to 65 years (mean = 37.78) for the comparison group. The length of time with their partners ranged from 1.5 to 46 years for the study group and from .17 to 42 years for the comparison group. The mean age of the partners was 55.10 years for the study group and 39.40 years for the comparison group. The majority of the participants in both groups had completed graduate school, with 54.5% in the study group and 58.3% in the comparison group holding graduate degrees. Seventy-three percent of the participants in the study group reported that they were married, and 61.1% of the participants in the comparison group were married. Seven participants in the study group had previous sexual dysfunction compared with two participants in the comparison group. All demographic data are summarized in Table 4.1 and Table 4.2, and health histories are shown in Table 4.3.

T-tests were used to test for significant differences between the study and the comparison groups. The study group significantly differed from the comparison group on

the variables of age, length of time with the partner, the partner's age, and the number of children. The education level, personal income, and marital status in the study group were similar to those in the comparison group; however, 92.7% of the women in the study group were Caucasian as compared to 38.9% of the comparison group. Although the women in the study group were significantly older than those in the comparison group and sexual issues are age-related, age was considered as a covariate when comparing the differences in body image, anxiety and depression, sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction between these two groups.

Table 4.1 Demographic Characteristics for Women with Gynecological/Rectal Cancer and Women Without Any Cancer for Continuous Variables

	Study Group (n = 55)			Comparison Group (n = 72)		
Variable	Mean	SD	Range	Mean	SD	Range
Age	52.73	9.73	25–70	37.78	11.94	21–65
Number of children	1.75	1.54	0–7	1.22	1.31	0–7
Length of time with the partner (years)	21.53	11.90	1.5–46	11.65	10.79	.17–42
Partner's age	55.10	10.84	25–78	39.40	11.80	21–67
Number of past medical diseases	.69	1.14	0–5	.19	.46	0–2

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.2 Demographic Characteristics for Women with Gynecological/Rectal Cancer and Women Without Any Cancer for Categorical Variables

	Study Group (n = 55)		Comparison Group (n = 72)	
Variable	*n*	%	*n*	%
Education				
High school	3	5.5	1	1.4
College	20	36.4	28	38.9
Graduate school	30	54.5	42	58.3
Other	2	3.6	1	1.4
Ethnicity				
Not Latino/Hispanic/Spanish origin	53	96.4	69	95.8
Latino/Hispanic/Spanish origin	2	3.6	3	4.2
Race				
Caucasian	51	92.7	28	38.9
Latino	0	0	1	1.4
African-American	1	1.8	3	4.2
Asian	3	5.5	38	52.8
Other	0	0	2	2.8
Employment status				
Not working	9	16.4	20	28.2
Retired	10	18.2	5	7.0
Full-time job	27	49.1	27	38.0
Part-time job	5	9.1	17	23.9
Other	4	7.3	2	2.8

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.2 Demographic Characteristics for Women with Gynecological/Rectal Cancer and Women Without Any Cancer for Categorical Variables (Continued)

	Study Group (*n* = 55)		Comparison Group (*n* = 72)	
Variable	*n*	%	*n*	%
Personal income				
<$20,000	9	17.3	26	38.8
$20,001–35,000	7	13.5	8	11.9
$35,001–50,000	10	19.2	9	13.4
$50,001–65,000	8	15.4	5	7.5
$65,001–80,000	9	17.3	5	7.5
$80,001–100,000	1	1.9	4	6.0
>$100,001	8	15.4	10	14.9
Gender of the partner				
Male	50	94.3	62	91.2
Female	3	5.7	6	8.8
Marital status				
Single	1	1.8	1	1.4
In a relationship	8	14.5	21	29.2
Married	40	72.7	44	61.1
Separate	1	1.8	0	0
Divorced	3	5.5	6	8.3
Widow	2	3.6	0	0

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.3 Health Histories for Women with Gynecological/Rectal Cancer and Women Without Any Cancer for Categorical Variables

	Study Group (n = 55)		Comparison Group (n = 72)	
Variable	*n*	%	*n*	%
Menopausal status				
Premenopause	3	5.5	48	66.7
Perimenopause	0	0	9	12.5
Postmenopause	22	40.0	13	18.1
Surgical menopause	30	54.5	2	2.8
Hormone replacement therapy				
Yes	11	20.0	4	5.6
Past medical history				
Diabetes	5	9.1	0	0
Hypertension	9	16.4	4	5.6
Cardiovascular disease	2	3.6	0	0
Others (hypothyroidism, asthma, cervical dysplasia, alcoholism, etc.)	15	27.3	10	13.9
Presence of previous sexual problems				
Yes	7	13.2	2	2.8

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Disease Characteristics

Eighty-six percent of study group participants had been diagnosed with gynecological cancer, and the remaining 15% experienced rectal cancer. The majority (49%) of the participants in the study group had cancer determined to be at stage three, and 26% of the participants experienced recurrence of the disease. No participants were in hospice at the time of the study. Most of the participants had undergone surgery (93%) and postoperative chemotherapy (86%) after being diagnosed with gynecological or rectal cancer. Six women with gynecological/rectal cancer (11%) had a stoma after the surgery, and one woman (2%) has a permanent stoma. Sixty-six percent of the participants with gynecological/rectal cancer were fully active without any restrictions on their daily activities. The disease characteristics are shown in Table 4.4.

Table 4.4 Disease Characteristics for Women with Gynecological/Rectal Cancer (*n* = 55)

Variable	Mean (SD)	Range
Time since surgery (years)	4.08 (3.39)	.33-15.00
Number of treatments experienced	2.11 (.63)	1-3
Variable	*n*	%
Type of cancer		
Rectal cancer	8	14.5
Gynecological cancer	47	85.5
Stage of disease		
Stage 1	11	20.8
Stage 2	11	20.8
Stage 3	26	49.1
Stage 4	5	9.4
Recurrence of disease		
Yes	14	25.5
Type of treatment received		
Preoperative radiotherapy	3	5.5
Preoperative chemotherapy	2	3.6
Surgery	51	92.7
Postoperative chemotherapy	47	85.5
Postoperative radiotherapy	13	23.6
Having a stoma (permanent type)	1	1.8
Had a stoma	6	10.9
Performance status		
"Fully active …"	36	65.5
"Restricted in physically strenuous activity …"	15	27.3
"Ambulatory and capable of all self-care …"	3	5.5
"Capable of only self-care …"	1	1.8

Major Independent Variables

Each participant completed the questionnaires for the DSFI Body Image Scale for Women, Hospital Anxiety and Depression Scale (HADS), the Modified Sexual Relationship Power Scale (SRPS-M), Sexual Self-Schema Scale (SSS), Female Sexual Function Index (FSFI), and Index of Sexual Satisfaction (ISS). Responses of every questionnaire were summed, converted, and weighted according to the developers' instructions. However, this section discusses only the major independent variables in this study, and the dependent variables were discussed in question four. *T*-tests were used to test the significant differences of age; time since surgery; and the scores of the DSFI Body Image Scale, HADS, SRPS-M, SSS, FSFI, and ISS between women with gynecological cancer and rectal cancer, and the results showed that women with gynecological cancer did not significantly differ from women with rectal cancer. Therefore, the study group was combined to include women with gynecological cancer and women with rectal cancer.

Further, as discussed in Chapter 2, age was a critical factor in exploring female sexual function and sexual satisfaction, and the mean age of the women (mean = 52.73, SD = 9.73) in the study group was significantly higher than that of the women in the comparison group (mean = 37.78, SD = 11.94) (t (124.44) = 7.77, $p < .001$). Therefore, ANCOVA was used to explore the differences among the DSFI body image scale, HADS, SRPS-M, and SSS for the women in the study and comparison groups by controlling the effect of age.

Body Image

Participants' total body image scores ranged from 5 to 39 with a mean of 24.31 for the study group and 20.03 for the comparison group (range 6–34); high scores indicate low levels of body image. Examinations of the mean subscale scores reveal that women with gynecological or rectal cancer perceive their bodies and genitalia to be less attractive than women without cancer do. The mean body image total score was higher for women with gynecological or rectal cancer than it was for women without cancer. Table 4.5 shows the mean, standard deviation, and range for the scales and subscales of body image for the study and comparison groups. However, after controlling the effect of age, the scores of body image, general body attributes, and genital attributes did not achieve the statistically significant differences between the study and comparison groups (Table 4.14).

The internal consistency of the two subscales and the total DSFI Body Image Scale were calculated for the study group and the comparison group using Cronbach's alpha. Internal consistency for the DSFI Body Image Scale for general body attributes and genital attributes was .82 for the study group and .74 for the comparison group. Reliability coefficients of the two subscales were .68 and .79, respectively, for the study group and .54 and .80, respectively, for the comparison group. The findings related to internal consistency of the DSFI Body Image Scale for women are summarized in Table 4.6.

Table 4.5 Descriptive Statistics for Body Image of Women with Gynecological/Rectal Cancer and Women Without Any Cancer

	Study Group (n = 51–53)			Comparison Group (n = 69–71)		
Variable	Mean	SD	Range	Mean	SD	Range
Body Image	24.31	8.00	5–39	20.03	6.97	6–34
General body attributes	12.38	4.92	4–23	10.06	4.03	3–20
Genital attributes	12.09	3.83	1–18	10.00	4.24	1–19

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.6 Reliability of the DSFI Body Image Scale

		Internal Consistency		
		Full Sample	Study Group	Comparison Group
Scale	Items	Alpha (N)	Alpha (n)	Alpha (n)
General body attributes	10	.62 (123)	.68 (53)	.54 (70)
Genital attributes	5	.80 (124)	.79 (53)	.80 (71)
Total	15	.79 (120)	.82 (51)	.74 (69)

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Anxiety and Depression

Scores on the 14-item HADS ranged from 1 to 28 for the study group and from 0 to 34 for the comparison group. The mean of anxiety and depression as measured by the HADS was 13.33 for the study group, compared with 10.91 for the comparison group;

high scores mean high levels of anxiety and depression. Table 4.7 presents the mean, standard deviation, and range for the scale and subscales of the HADS. In addition, 30% of the participants in the study group scored within the range of 11 to 21, which indicates anxiety, compared with 18.6% in the comparison group. Six participants in the study group were identified as having probable depression disorders, which was more than the number of participants identified as such in the comparison group. The results regarding the frequencies of normal, possible, and probable anxiety and depression disorders are displayed in Table 4.8. Further, there was a significant difference in anxiety levels between women with gynecological/rectal cancer and those without any cancer after controlling the effect of age; however, the scores of the total scale of anxiety and depression and the subscale of depression did not significantly differ between the study and comparison groups (Table 4.14).

Internal consistency of the total HADS scale (14 items) was .87 for the study group, which was higher than that of the comparison group. Reliabilities of the anxiety and depression subscales were .85 and .83, respectively, for the study group and .80 and .77, respectively, for the comparison group. The findings related to internal consistency of the HADS are summarized in Table 4.9.

Table 4.7 Descriptive Statistics for Anxiety and Depression for Women with Gynecological/Rectal Cancer and Women Without Any Cancer

	Study Group (n = 54)			Comparison Group (n = 70–71)		
Variable	Mean	SD	Range	Mean	SD	Range
Anxiety and Depression	13.33	6.66	1–28	10.91	6.33	0–34
Anxiety	8.83	4.24	0–18	7.11	3.90	0–19
Depression	4.50	3.55	0–13	3.76	3.32	0–15

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.8 Frequencies of Normal, Possible, and Probable Anxiety and Depression Disorder for Women with Gynecological/Rectal Cancer and Women Without Any Cancer

		Study Group (n = 54)		Comparison Group (n =70–71)	
Variable		*n*	%	*n*	%
Anxiety	Normal	22	40.7	43	61.4
	Possible	16	29.6	14	20.0
	Probable	16	29.6	13	18.6
Depression	Normal	43	79.6	63	88.7
	Possible	5	9.3	5	7.0
	Probable	6	11.1	3	4.2

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.9 Reliability of the Hospital Anxiety and Depression Scale

		Internal Consistency		
		Full sample	Study group	Comparison group
Scale	# Items	Alpha (*N*)	Alpha (*n*)	Alpha (*n*)
Anxiety	7	.83 (124)	.85 (54)	.80 (70)
Depression	7	.80 (125)	.83 (54)	.77 (71)
Total	14	.86 (124)	.87 (54)	.85 (70)

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Sexual Relationship Power

The mean of sexual relationship power as measured by the SRPS was 2.88 for the study group and 2.80 for the comparison group; high scores mean high levels of sexual relationship power. In addition, women with gynecological or rectal cancer perceived higher relationship control and decision-making dominance than women without any cancer. Table 4.10 shows a summary of the SRPS scores for the study and comparison groups. After removing the covariate effect of age, there were statistically significant differences between women with gynecological/rectal cancer and women without cancer in the scores of the SRPS and its subscales of relationship control and decision-making dominance (Table 4.14).

The SRPS-M has shown good validity and reliability (Pulerwitz et al., 2000). However, the modified scale, which has not been used in any cancer populations, was used for not only general female populations but also gynecological and rectal cancer populations in this study. Therefore, the internal consistencies of the two subscales and

the total SRPS-M were calculated using Cronbach's alpha in this study. Reliability coefficients of the relationship control and decision-making dominance subscales were .81 and .61, respectively, for the study group and .85 and .59, respectively, for the comparison group. Further, internal consistency for the SRPS-M total score was .83 for the study group and was similar for the comparison group. Table 4.11 summarizes the findings related to the internal consistency of the SRPS-M.

Table 4.10 Descriptive Statistics for Sexual Relationship Power for Women with Gynecological/Rectal Cancer and Women Without Any Cancer

	Study Group (n = 54–55)			Comparison Group (n = 71–72)		
Variable	Mean	SD	Range	Mean	SD	Range
Sexual relationship power	2.88	.40	1.74–3.67	2.80	.44	1.08–3.88
Relationship control	3.26	.45	1.83–4.00	3.19	.53	1.17–4.00
Decision-making dominance	2.50	.49	1.43–4.00	2.42	.52	1.00–4.00

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.11 Reliability of the Modified Sexual Relationship Power Scale

		Internal Consistency		
		Full sample	Study group	Comparison group
Scale	Alpha	Alpha (*N*)	Alpha (*n*)	Alpha (*n*)
Relationship control	12	.84 (126)	.81 (55)	.85 (71)
Decision-making dominance	7	.60 (126)	.61 (54)	.59 (72)
Total	19	.84 (125)	.83 (54)	.84 (71)

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Sexual Self-Schema

The total SSS Scale scores ranged from 34 to 111 with a mean of 62.66 for the study group and 56.58 for the comparison group (range from 25 to 90); high scores mean a more positive sexual self-schema. Women with gynecological or rectal cancer were more open-direct than women without cancer; in addition, women without cancer showed more embarrassed-conservative tendencies compared with women with gynecological or rectal cancer. The results of the SSS Scale are summarized in Table 4.12. However, after controlling the covariate of age, there was a statistically significant difference in the scores of the embarrassed-conservative subscale between the study and comparison groups, but the scores of the total SSS Scale and the passionate-romantic and open-direct subscales did not show significant differences between the two groups (Table 4.14).

The sexual self-schema scale has shown its reliability and validity in previous studies (Andersen & Cryanowski, 1994; Carpenter et al., 2009) and was used in this

study to explore individual differences in sexual views to predict sexual function and sexual satisfaction after rectal cancer and gynecological cancer and to buffer the negative effects of patients' psychological statuses after surgery. Cronbach's alpha of the total SSS Scale was .73 for the study group and .63 for the comparison group in this study. Reliability coefficients for the SSS subscales, including passionate-romantic factor, open-direct factor, and embarrassed-conservative factor, ranged from .63 to .80 for the study group and .58 to .77 for the comparison group. The findings related to internal consistency of the SSS Scale are summarized in Table 4.13.

Table 4.12 Descriptive Statistics for Sexual Self-Schema for Women with Gynecological/Rectal Cancer and Women Without Any Cancer

	Study Group (n = 53–55)			Comparison Group (n = 66–70)		
Variable	Mean	SD	Range	Mean	SD	Range
Sexual self-schema	62.66	14.89	34–111	56.58	14.41	25–90
Passionate-romantic	42.66	8.01	28–60	42.78	7.05	24–60
Open-direct	39.04	6.78	26–52	35.61	7.21	19–52
Embarrassed-conservative	19.38	5.97	1–33	21.96	5.54	8–36

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.13 Reliability of the Sexual Self-Schema Scale

		Internal Consistency		
		Full sample	Study group	Comparison group
Scale	# Items	Alpha (*N*)	Alpha (*n*)	Alpha (*n*)
Passionate-romantic	10	.78 (122)	.80 (53)	.77 (69)
Open-direct	9	.77 (124)	.74 (55)	.77 (69)
Embarrassed-conservative	7	.62 (125)	.63 (55)	.58 (70)
Total	26	.68 (119)	.73 (53)	.63 (66)

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.14 Comparisons of Means for the Study Scales and Their Subscales After Removal of the Influence of Covariate of Age (ANCOVA)

	Study Group (n = 51–55)	Comparison Group (n = 66–72)		
Variable	Mean	Mean	*F*	*p*-value
Body image	23.65	20.52	3.61	.06
General body attributes	10.11	10.26	3.55	.06
Genital attributes	10.61	10.36	2.02	.16
Anxiety and depression	13.38	10.88	3.06	.08
Anxiety	9.03	6.96	5.34	.02
Depression	4.38	3.85	.50	.48
Sexual relationship power	2.97	2.74	7.26	.008
Relationship control	3.36	3.11	6.05	.02
Decision-making dominance	2.58	2.36	4.19	.04
Sexual self-schema	61.56	57.46	1.52	.22
Passionate-romantic	42.42	42.97	.10	.75
Open-direct	38.14	36.32	1.41	.24
Embarrassed-conservative	19.24	22.07	5.02	.03

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Research Questions

Each research question was answered by using appropriate statistics, and the statistical data were presented under their corresponding research questions. Further, prior to conducting the analysis of the hierarchical multiple linear regression to explore the third question, the bivariate correlations between the study variables were calculated to address the assumptions of multiple linear regression analyses. Therefore, the first two research questions addressed this preliminary work before the third was answered.

Research Question 1

Are there relationships among demographic characteristics, health histories, and disease characteristics with respect to (a) body image, (b) anxiety and depression, (c) sexual relationship power, (d) female sexual function, and (e) sexual satisfaction?

The correlations among the demographic characteristics, disease characteristics, and major study variables are displayed in Table 4.15 and Table 4.16. The statistical significance was set at an alpha level of .05.

Significant but moderate correlations were found between anxiety and depression and the variables for time since surgery ($r = –.37$, $p < .01$) and performance status ($r = –.40$, $p < .01$) for the group of women with gynecological or rectal cancer. This indicates that high anxiety and depression are related to the short time since surgery and poor performance status. Sexual relationship power and performance had a significant positive relationship for the sample of women with gynecological or rectal cancer ($r = .31$, $p <$

.05), indicating that the higher their sexual relationship power is, the better their performance status is.

Sexual relationship power and the personal characteristics of age ($r = –.39$, $p < .001$), partner's age ($r = –.44$, $p < .001$), and length of time with the partner ($r = –.40$, $p < .001$) had significant negative relationships for women without any cancer, indicating that high sexual relationship power is correlated with young age, young age of the partner, and short length of time with the partner. Female sexual function had significantly negative relationships with age ($r = –.27$, $p < .05$), length of time with the partner ($r = –.28$, $p < .05$) and the number of medical diseases ($r = –.28$, $p < .05$) for women without any cancer, indicating that better female sexual function is correlated with younger age, shorter length of time with the partner, and fewer medical diseases. There were also small but significant correlations between sexual satisfaction and the variables for age ($r = .25$, $p < .05$) and length of time with the partner ($r = .26$, $p < .05$). This means that high sexual satisfaction was related to young age and short length of time with the partner.

Table 4.15 Bivariate Correlations among Demographic Characteristics, Health Histories, Disease Characteristics, and the Major Study Variables for Women with Gynecological/Rectal Cancer (n = 48–55)

Variables	Body Image	Anxiety and Depression	Sexual Relationship Power	Female Sexual Function	Sexual Satisfaction
Age	.02	–.10	–.11	–.04	–.19
Partner's age	.00	–.09	–.14	–.05	–.13
Length of time with the partner	.11	–.17	–.02	–.26	.08
Number of children	.07	–.25	–.04	.11	–.13
Number of medical diseases	.26	.14	–.11	–.15	.18
Time since surgery	–.14	–.37**	.14	.02	–.08
Cancer stage	–.09	–.15	.01	–.07	.03
Number of treatments	.02	–.02	–.05	–.27*	.29*
Performance status	–.22	–.40**	.31*	.16	–.10

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Table 4.16 Bivariate Correlations among Demographic Characteristics and the Major Study Scales for Women Without Any Cancer (n = 64–72)

Variables	Body Image	Anxiety and Depression	Sexual Relationship Power	Female Sexual Function	Sexual Satisfaction
Age	.18	.05	–.39***	–.27*	.25*
Partner's age	.13	.11	–.44***	–.24	.22
Length of time with the partner	.18	.03	–.40***	–.28*	.26*
Number of children	.20	.01	–.22	–.14	.24
Number of medical diseases	.18	.09	–.08	–.28*	.20

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Research Question 2

What is the relationship among body image, psychological status (anxiety and depression), sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction?

The Pearson correlation coefficient was used to test the relationship between the variables of body image, anxiety and depression, sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction. Alpha was set at .05 for this analysis. Table 4.17 and Table 4.18 summarize the correlation coefficients for Research Question 2.

Body image and anxiety and depression. The correlation coefficient between body image and the anxiety and depression score was .57 ($p < .001$) for women with gynecological or rectal cancer and .30 ($p < .05$) for those without any cancer. This finding indicates that the lower women's degree of appreciation for their bodies is, the higher their anxiety and depression.

Body image and sexual relationship power. There was a significant negative relationship between body image and sexual relationship power for women with gynecological or rectal cancer ($r = –.31$, $p < .05$). This indicates that poor body image is related to low sexual relationship power for women with gynecological or rectal cancer. However, this relationship was not statistically significant for the group of women without any cancer ($r = –.19$, $p > .05$). While both groups of women perceived this relationship as negative, the sample of women with gynecological or rectal cancer demonstrated a significantly negative relationship.

Body image and sexual self-schema. The Pearson correlation between body image and sexual self-schema was –.33 ($p < .05$) for the sample of women with gynecological or rectal cancer and –.37 ($p < 0.01$) for the sample of women without any cancer. This indicates that the better their appreciation of their bodies is, the more positive their sexual self-schemas are.

Body image and female sexual function. There was a moderately negative correlation between participants' appreciation of their bodies and female sexual function for women without any cancer ($r = –.34$, $p < .01$). This indicates that a higher degree of appreciation for their bodies is associated with better female sexual function. However, this relationship was not statistically significant for women with gynecological or rectal cancer ($r = –.27$, $p > .05$).

Body image and sexual satisfaction. The relationship between body image and sexual satisfaction was .33 ($p < .05$) for women with gynecological or rectal cancer and .44 ($p < .001$) for those without any cancer. This indicates that a better body image is associated with higher sexual satisfaction.

Anxiety and depression and sexual relationship power. There was a negative relationship between anxiety and depression and sexual relationship power for women with gynecological or rectal cancer ($r = –.32$, $p < .05$) and those without any cancer ($r = –.31$, $p < .01$). This indicates that the higher their anxiety and depression are, the lower their sexual relationship power is.

Anxiety and depression and sexual self-schema. There was a significant negative relationship between anxiety and depression and sexual self-schema for the group of

women without any cancer ($r = –.27$, $p < .05$). This indicates that higher anxiety and depression are related to lower positive sexual self-schema. However, this relationship was not supported for the group of women with gynecological or rectal cancer ($r = –.14$, $p > .05$).

Anxiety and depression and female sexual function. The correlation coefficient between anxiety and depression and female sexual function was –.36 ($p < .01$) for the group of women with gynecological or rectal cancer. This indicates that higher anxiety and depression are associated with worse female sexual function. However, it was not statistically significant for the group of women without any cancer ($r = –.18$, $p > .05$).

Anxiety and depression and sexual satisfaction. There was a moderately positive relationship between anxiety and depression and sexual satisfaction for women with gynecological or rectal cancer ($r = .40$, $p < .01$). This indicates that the higher a participant's anxiety and depression were, the lower her sexual satisfaction was. This relationship was also statistically significant for women without any cancer ($r = .24$, $p < .05$).

Sexual relationship power and sexual self-schema. The Pearson correlation between sexual relationship power and sexual self-schema was .23 for women without any cancer. This indicates that higher sexual relationship power is associated with more positive sexual self-schema. However, this relationship was not statistically significant for either group of women.

Sexual relationship power and female sexual function. There was no significant relationship between sexual relationship power and female sexual function for either group of women.

Sexual relationship power and sexual satisfaction. There was a significant negative relationship between sexual relationship power and sexual satisfaction for women with gynecological or rectal cancer ($r = –.44$, $p < .001$). This indicates that the higher a woman's sexual relationship power is, the higher her sexual satisfaction is. This relationship was also statistically significant for the group of women without any cancer ($r = –.39$, $p < .001$).

Sexual self-schema and female sexual function. There was a significant positive relationship between sexual self-schema and female sexual function for women with gynecological or rectal cancer ($r = .38$, $p < .01$) and those without cancer ($r = .25$, $p < .05$). This indicates that a more positive sexual self-schema is related to better female sexual function.

Sexual self-schema and sexual satisfaction. There was a negative relationship between sexual self-schema and sexual satisfaction for women with gynecological or rectal cancer ($r = –.31$, $p < .05$). While both groups of women, those with gynecological or rectal cancer and those without any cancer, perceived this relationship as negative, the group of women with gynecological or rectal cancer presented a significantly stronger relationship than the group of women without any cancer.

Female sexual function and sexual satisfaction. The Pearson correlation between female sexual function and sexual satisfaction was –.72 ($p < .001$) for the group of

women with gynecological or rectal cancer and –.58 ($p < .001$) for those without any cancer. This indicates that better female sexual function is related to higher sexual satisfaction.

Table 4.17 Bivariate Correlations Among the Major Study Variables for Women with Gynecological/Rectal Cancer (n = 49–53)

Variables	Body Image	Anxiety and Depression	Sexual Relationship Power	Sexual Self-Schema	Female Sexual Function
Body image	-				
Anxiety and depression	.57***	-			
Sexual relationship power	–.31*	–.32*	-		
Sexual self-schema	–.33*	–.14	–.02	-	
Female sexual function	–.27	–.36**	.12	.38**	-
Sexual satisfaction	.33*	.40**	–.44***	–.31*	–.72***

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Table 4.18 Bivariate Correlations Among the Major Study Scales for Women Without Any Cancer (n=63-70)

Variables	Body Image	Anxiety and Depression	Sexual Relationship Power	Sexual Self-Schema	Female Sexual Function
Body image	-				
Anxiety and depression	.30*	-			
Sexual relationship power	–.19	–.31**	-		
Sexual self-schema	–.37**	–.27*	.23	-	
Female sexual function	–.34**	–.18	.14	.25*	-
Sexual satisfaction	.44***	.24*	–.39***	–.16	–.58***

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Research Question 3

Does female sexual self-schema moderate (or mediate) the effects of body image, psychological status (anxiety and depression), and sexual relationship power on female sexual function and sexual satisfaction?

The hierarchical multiple linear regression (HMLR) and path analysis were performed to answer the third question. The HMLR analyses were used to test the effect of the sexual self-schema as a moderator variable in the relationships among the independent variables of body image, anxiety and depression, and sexual relationship power and the dependent variables of female sexual function and sexual satisfaction. Additionally, the sexual self-schema was also tested as a mediator variable in the relationships among the independent variables of body image, anxiety and depression, and sexual relationship power and the dependent variables of female sexual function and sexual satisfaction by using the path analysis.

Only the variables of demographic or disease characteristics significantly related to the outcome variables of sexual function and sexual satisfaction were entered in the HMLR model. Additionally, the correlations between independent variables were addressed and the procedures for the assumptions were taken prior to conducting the HMLR analysis. The next two sections show the correlations among the variables and the assumption testing before presenting the results of HMLR.

Correlations among the Variables

Table 4.19 displays the correlations among the study variables. The dependent variable of female sexual function was significantly related to having gynecological or rectal cancer, the participant's age, the length of time with the partner, the partner's age, the number of past diseases, having hormone replacement therapy, presence of previous sexual problems, body image, anxiety and depression, and sexual self-schema. Significant correlations were also observed between the dependent variable of sexual satisfaction and the variables for having gynecological or rectal cancer, the participant's age, the length of time with the partner, the partner's age, the number of the past diseases, body image, anxiety and depression, sexual relationship power, and female sexual function. However, the independent variable for the partner's age was not put in the analysis of HMLR because a high and significant correlation was found between the participant's age and the partner's age ($r = .93$, $p < .001$), which is higher than .8s (Allison, 1999).

Table 4.19 Bivariate Correlations Between the Study Variables Among Women with Gynecological/Rectal Cancer and Without Any Cancer (n = 112–127)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Cancer	-											
2. Age	.56***	-										
3. Length of time with partner	.40***	.75***	-									
4. Partner's age	.57***	.93***	.74***	-								
5. Past medical history	.29***	.33***	.30***	.28**	-							
6. Hormone replacement therapy	.22*	.17	.16	.16	.11	-						
7. Presence of previous sexual problems	.20*	.28**	.28**	.24**	.15	.18*	-					
8. Body image	.28**	.25**	.24**	.22*	.28**	.10	-.02	-				
9. Anxiety and depression	.18*	.10	.01	.11	.16	-.08	.05	.46***	-			
10. Sexual relationship power	.09	-.19*	-.16	-.20*	-.06	.06	-.03	-.22*	-.29***	-		
11. Sexual self-schema	.20*	.20*	-.01	.16	.10	.04	.04	-.27**	-.14	.13	-	
12. Female sexual function	-.41***	.36***	-.40***	-.35***	-.27**	-.18*	-.18*	-.38***	-.30***	.07	.19*	-

13. Sexual satisfaction	.35***	.23*	.28**	.23*	.27**	.12	.14	.43***	.35***	-.33**	-.14	-.69***

Cancer: 1 = Yes, 0 = No; Hormone replacement therapy: 1 = Yes, 0 = No; Presence of previous sexual problems: 1 = Yes, 0 = No; *$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Assumptions in the Hierarchical Multiple Linear Regression

The assumptions for using HMLR analyses are independent of the subjects, normal distribution, homoscedasticity, and linearity (Field, 2005; Meyers, Gamst, & Guarino, 2006). Before checking assumptions and conducting the regression, outliers were detected to avoid bias in the models (Field, 2005).

Outlier. The test of Mahalanobis distance values was used to detect multivariate outliers. One case in the study group was found to be a multivariate outlier no matter whether the dependent variable was FSFI or ISS. In this case, the Mahalanobis distance value exceeded the chi-square criterion at an alpha level of .001. This case was deleted before conducting the multiple regression analyses.

Independence. The assumption of independent observations was assumed. The participants were answering the items independently of one another.

Normality. The assumption of normality was met by examining the Q-Q plots and the skewness and kurtosis statistics. The skewness and kurtosis statistics for the dependent variables of female sexual function and sexual satisfaction were within the –1 to +1 range. The normal Q-Q plots also looked reasonably normal (Figure 4.1).

Homoscedasticity. The assumption of homoscedasticity was met by using the graph of standardized residuals (*ZRESID) and standardized predicted values (*ZPRED) for the dependent variables: female sexual function and sexual satisfaction. The two scatter plots for female sexual function and sexual satisfaction showed that the dots dispersed randomly around zero (Figure 4.2).

Linearity. The shapes of the matrix scatter plots showed enough linearity in the relationships among the continuous variables of age, the length of time with the partner, body image, anxiety and depression, sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction (Figure 4.3). However, the number of the past diseases was not linear to the dependent variables of female sexual function and sexual satisfaction although it was significantly related to female sexual function and sexual satisfaction. Therefore, the variable of the number of the past diseases was not put in the multiple regression model.

Figure 4.1 Normal Q-Q Plots of Female Sexual Function and Sexual Satisfaction

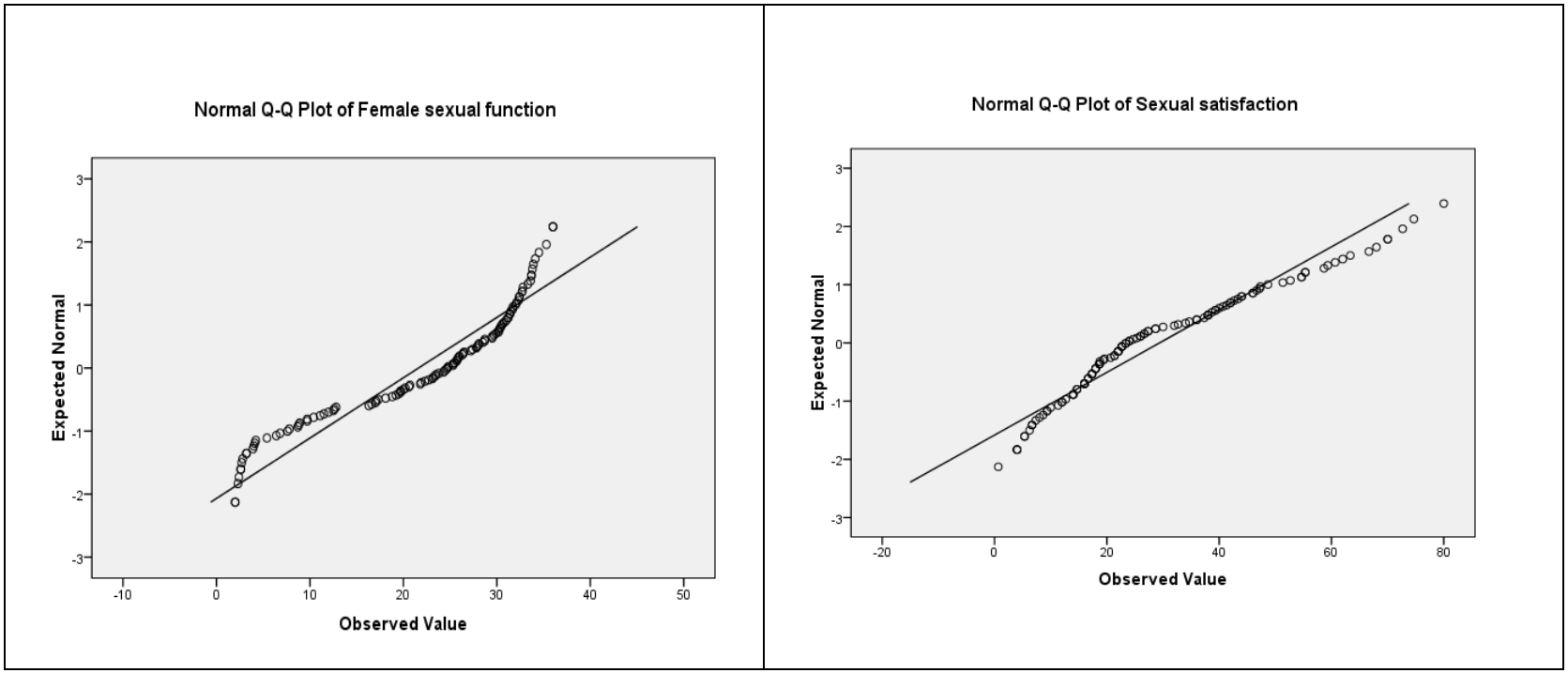


Figure 4.2 Graphs of Standardized Residuals and Standardized Predicted Values for Female Sexual Function and Sexual Satisfaction

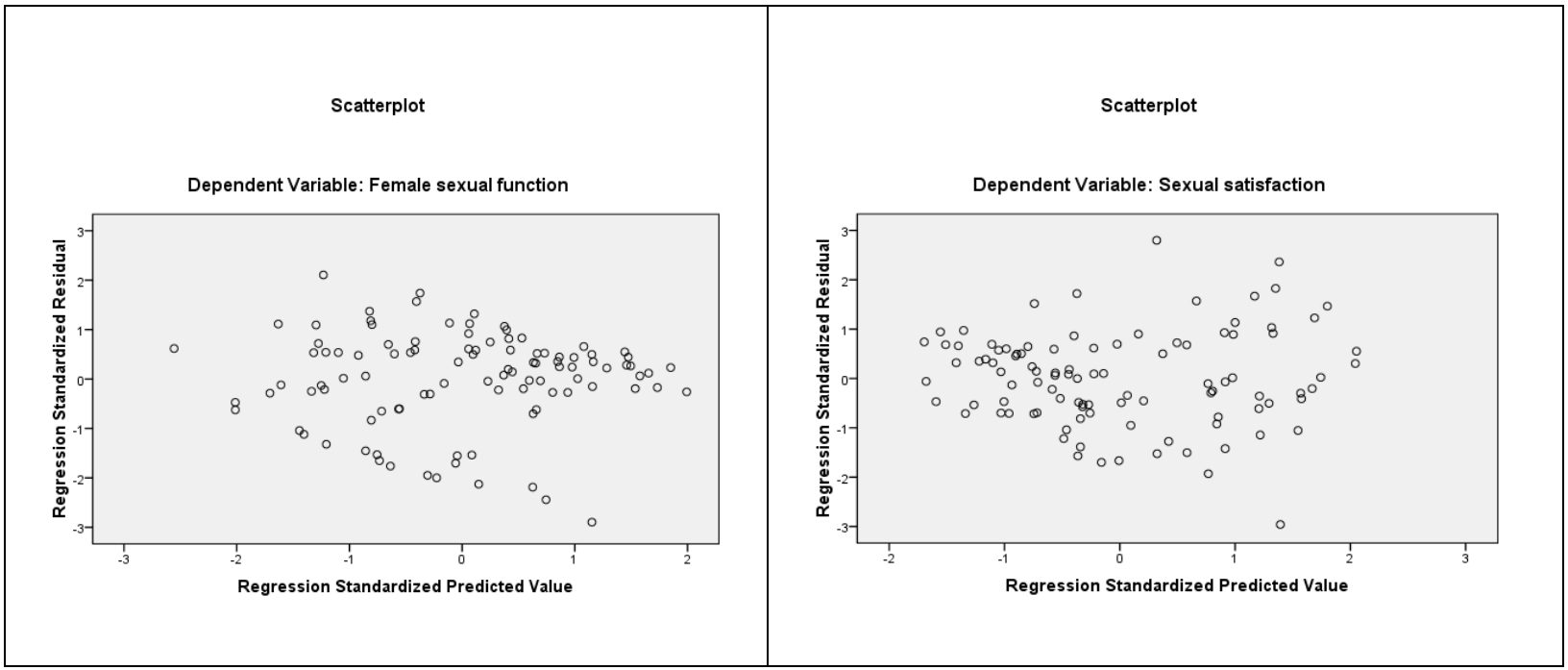
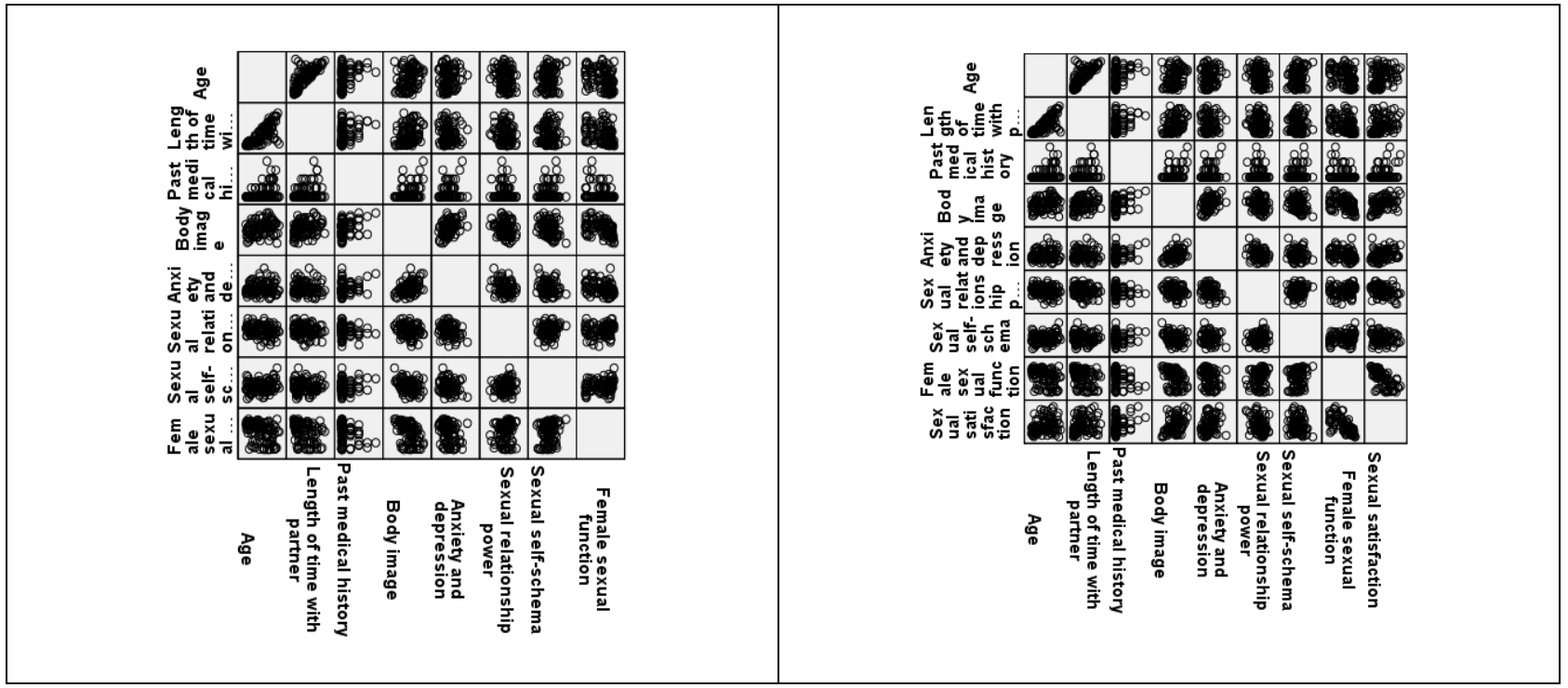


Figure 4.3 Shapes of the Matrix Scatter Plots for Female Sexual Function and Sexual Satisfaction



Hierarchical Multiple Linear Regression

The predictors of hierarchical regression were selected based on the bivariate correlations of the variables in the conceptual framework. The known predictors were entered into the regression model in order of the conceptual framework in predicting the outcome variables of female sexual function or sexual satisfaction.

The hierarchical regression was conducted with female sexual function as a dependent variable and personal characteristics (gynecological/rectal cancer, age, length of the time with the partner, hormone replacement therapy, and presence of previous sexual problems), body image, anxiety and depression, sexual relationship power, and sexual self-schema as independent variables.

Regression results with the dependent variable of sexual function are summarized in Table 4.20 to test the sexual self-schema as a predictor. The final model was statistically significant, F (9, 92) = 6.77, $p < .000$, R^2 *adj* = .34. The variable of having gynecological/rectal cancer contributed significantly to the independent variable of female sexual function. In addition, the predictor of sexual self-schema also made a significant contribution (R^2 change = .03, $p < .05$) after controlling for gynecological/rectal cancer, age, length of the time with the partner, hormone replacement therapy, presence of previous sexual problems, body image, anxiety and depression, and sexual relationship power. Women with gynecological or rectal cancer had poorer sexual function than women without any cancer, and women with a more positive sexual self-schema reported good sexual function.

Table 4.20 Hierarchical Multiple Regression of Predictor Variables on Sexual Function for Women with Gynecological/Rectal Cancer and Those Without Any Cancer (n = 102)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)
Gynecological/rectal cancer	–.37***	–.32**	–.35**
Age	.03	.08	–.01
Length of time with partner	–.19	–.16	–.10
Hormone replacement therapy	–.03	–.03	–.03
Presence of previous sexual problems	–.08	–.09	–.09
Body image		–.24*	–.18
Anxiety and depression		–.16	–.14
Sexual relationship power		.07	.06
Sexual self-schema			.20*
F	6.36***	6.79***	6.77***
R^2	.25	.37	.40
Adjusted R^2	.21	.31	.34
R^2 change	.25***	.12***	.03*

Gynecological/rectal cancer: 1 = Yes, 0 = No;

Hormone replacement therapy: 1 = Yes, 0 = No;

Presence of previous sexual problems: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

The results of the hierarchical regression with the dependent variable of sexual satisfaction are presented in Table 4.21 to present the sexual self-schema as a predictor. Personal characteristics (gynecological/rectal cancer, age, and length of the time with the partner) were entered in Model 1; body image, anxiety and depression, and sexual relationship power were entered in Model 2; sexual self-schema was entered in Model 3; and female sexual function was entered in Model 4.

The final model explained 59% of the variance in sexual satisfaction. Further, the model was statistically significant at predicting the outcome variable of sexual satisfaction, F (8, 92) =16.46, $p < .001$. Having gynecological or rectal cancer, sexual relationship power, and female sexual function made significant contributions to the prediction of sexual satisfaction, especially for female sexual function (R^2 change = .21, $p < .001$). Women with gynecological or rectal cancer had worse sexual satisfaction, women with higher sexual relationship power had higher sexual satisfaction, and women with better female sexual function reported greater sexual satisfaction. In the third model, with gynecological/rectal cancer, age, length of the time with the partner, body image, anxiety and depression, sexual relationship power, and sexual self-schema, the variables of gynecological/rectal cancer, body image, and sexual relationship power contributed significantly to sexual satisfaction. However, the predictor of sexual self-schema did not make a significant contribution in the third model after controlling the other predictors (R^2 change = .01).

Table 4.21 Hierarchical Multiple Regression of Predictor Variables on Sexual Satisfaction for Women with Gynecological/Rectal Cancer and Those Without Any Cancer (n = 101)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)
Gynecological/rectal cancer	.38***	.42***	.44***	.23*
Age	–.08	–.20	–.16	–.18
Length of time with partner	.15	.08	.05	–.02
Body image		.25**	.23*	.14
Anxiety and depression		.06	.06	–.02
Sexual relationship power		–.32***	–.31***	–.27***
Sexual self-schema			–.08	.03
Female sexual function				–.57***
F	6.43***	9.50***	8.23***	16.46***
R^2	.17	.38	.38	.59
Adjusted R^2	.14	.34	.34	.55
R^2 change	.17***	.21***	.01	.21***

Gynecological/rectal cancer: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Moderation Effects of Sexual Self-Schema using HMRL

According to the conceptual framework in this study, hierarchical multiple linear models were used to test the moderator effects related to sexual self-schema on the dependent variables of sexual function and sexual satisfaction. All statistical tests were performed based on an alpha level of .05.

First, the researcher tested the moderator effects of sexual self-schema on body image for the outcome variables of sexual function and sexual satisfaction. No significant moderation effect was detected for either sexual function, $\Delta R^2 = .00$, $p > .05$ (Table 4.22), or sexual satisfaction, $\Delta R^2 = .00$, $p > .05$ (Table 4.23).

Second, the researcher tested the moderator effects of sexual self-schema on anxiety and depression for the outcome variables of sexual function and sexual satisfaction. Again, no significant moderation effect was detected for either sexual function, $\Delta R^2 = .01$, $p > .05$ (Table 4.24), or sexual satisfaction, $\Delta R^2 = .02$, $p > .05$ (Table 4.25).

Third, the researcher entered the interaction term of sexual self-schema and sexual relationship power in the regression models to detect the moderator effects of sexual self-schema on sexual relationship power for sexual function and sexual satisfaction. The significant moderation effect was discovered for sexual function ($\Delta R^2 = .06$, $p < .01$) and sexual satisfaction ($\Delta R^2 = .06$, $p < .01$). The interaction term accounted for 6% of the variance in sexual function and 6% of the variance in sexual satisfaction. The results are summarized in Table 4.26 and Table 4.27.

Table 4.22 Hierarchical Multiple Regression for Sexual Self-Schema as a Moderator of the Effect of Body Image on Sexual Function Among Women with Gynecological/Rectal Cancer and Those Without Any Cancer (n = 102)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)
Gynecological/rectal cancer	–.37***	–.33**	–.32**	–.35**	–.35**
Age	–.03	.08	.08	–.01	.01
Length of time with partner	–.19	–.23	–.16	–.10	–.11
Hormone replacement therapy	–.03	–.05	–.03	–.03	–.04
Presence of previous sexual problems	–.08	–.06	–.09	–.09	–.08
Anxiety and depression		–.26**	–.16	–.14	–.15
Sexual relationship power		.09	.07	.06	.07
Centered body image			–.24*	–.18	–.19
Centered sexual self-schema				.20*	.19*
Interaction: centered body image × centered sexual self-schema					.06
F	6.36***	6.60***	6.79***	6.77***	6.11***
R^2	.25	.33	.37	.40	.40
Adjusted R^2	.21	.28	.31	.34	.34
R^2 change	.25***	.08**	.04*	.03	.00

Gynecological/rectal cancer: 1 = Yes, 0 = No;

Hormone replacement therapy: 1 = Yes, 0 = No;

Presence of previous sexual problems: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Table 4.23 Hierarchical Multiple Regression for Sexual Self-Schema as a Moderator of the Effect of Body Image on Sexual Satisfaction Among Women with Gynecological/Rectal Cancer and Those Without Any Cancer (n = 101)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)
Gynecological/rectal cancer	.38***	.44***	.42***	.44	.44***
Age	–.08	–.21	–.20	–.16	–.15
Length of time with partner	.15	.15	.08	.05	.05
Anxiety and depression		.16	.06	.06	.06
Sexual relationship power		–.34***	–.32***	–.31***	–.31***
Centered body image			.25**	.23*	.23*
Centered sexual self-schema				–.08	–.08
Interaction: centered body image × centered sexual self-schema					.02
F	6.43***	9.39***	9.50***	8.23***	7.14***
R^2	.17	.33	.38	.38	.38
Adjusted R^2	.14	.30	.34	.34	.33
R^2 change	.17***	.17***	.05**	.01	.00

Gynecological/rectal cancer: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Table 4.24 Hierarchical Multiple Regression for Sexual Self-Schema as a Moderator of the Effect of Anxiety and Depression on Sexual Function Among Women with Gynecological/Rectal Cancer and Those Without Any Cancer (n = 102)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)
Gynecological/rectal cancer	–.37***	–.36***	–.32**	–.35**	–.34**
Age	.03	.08	.08	–.01	–.02
Length of time with partner	–.19	–.12	–.16	–.10	–.11
Hormone replacement therapy	–.03	–.02	–.03	–.03	–.03
Presence of previous sexual problems	–.08	–.11	–.09	–.09	–.08
Body image		–.30***	–.24*	–.18	–.15
Sexual relationship power		.11	.07	.06	.04
Centered anxiety and depression			–.16	–.14	–.17
Centered sexual self-schema				.20*	.20*
Interaction: centered anxiety and depression × centered sexual self-schema					–.08
F	6.36***	7.29***	6.79***	6.77***	6.17***
R^2	.25	.35	.37	.40	.40
Adjusted R^2	.21	.30	.31	.34	.34
R^2 change	.25***	.10***	.02	.03*	.01

Gynecological/rectal cancer: 1 = Yes, 0 = No;

Hormone replacement therapy: 1 = Yes, 0 = No;

Presence of previous sexual problems: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Table 4.25 Hierarchical Multiple Regression for Sexual Self-Schema as a Moderator of the Effect of Anxiety and Depression on Sexual Satisfaction Among Women with Gynecological/Rectal Cancer and Those Without Any Cancer (n = 101)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)
Gynecological/rectal cancer	.38***	.44***	.42***	.44***	.41***
Age	–.08	–.20	–.20	–.16	–.16
Length of time with partner	.15	.07	.08	.05	.09
Body image		.28**	.25**	.23*	.17
Sexual relationship power		–.33***	–.32***	–.31***	–.29**
Centered anxiety and depression			.06	.06	.11
Centered sexual self-schema				–.08	–.08
Interaction: centered anxiety and depression × centered sexual self-schema					.16
F	6.43***	11.37***	9.50***	8.23***	7.84***
R^2	.17	.37	.38	.38	.41
Adjusted R^2	.14	.34	.34	.34	.35
R^2 change	.17***	.21***	.00	.01	.02

Gynecological/rectal cancer: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Table 4.26 Hierarchical Multiple Regression for Sexual Self-Schema as a Moderator of the Effect of Sexual Relationship Power on Sexual Function Among Women with Gynecological/Rectal Cancer and Those Without Any Cancer (n = 102)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)
Gynecological/rectal cancer	–.37***	–.29**	–.32**	–.35**	–.29**
Age	.03	.05	.08	–.01	.02
Length of time with partner	–.19	–.16	–.16	–.10	–.19
Hormone replacement therapy	–.03	–.04	–.03	–.03	–.08
Presence of previous sexual problems	–.08	–.09	–.09	–.09	–.04
Body image		–.25*	–.24*	–.18	–.11
Anxiety and depression		–.18	–.16	–.14	–.17
Centered sexual relationship power			.07	.06	.07
Centered sexual self-schema				.20*	.13
Interaction: centered sexual relationship power × centered sexual self-schema					.27**
F	6.36***	7.72***	6.79***	6.77***	7.57***
R^2	.25	.37	.37	.40	.45
Adjusted R^2	.21	.32	.31	.34	.39
R^2 change	.25***	.12***	.00	.03*	.06**

Gynecological/rectal cancer: 1 = Yes, 0 = No;

Hormone replacement therapy: 1 = Yes, 0 = No;

Presence of previous sexual problems: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Table 4.27 Hierarchical Multiple Regression for Sexual Self-Schema as a Moderator of the Effect of Sexual Relationship Power on Sexual Satisfaction Among Women with Gynecological/Rectal Cancer and Those Without Any Cancer (n = 101)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)
Gynecological/rectal cancer	.38***	.31**	.42***	.44***	.39***
Age	–.08	–.10	–.20	–.16	–.19
Length of time with partner	.15	.09	.08	.05	.13
Body image		.29**	.25**	.23*	.17
Anxiety and depression		.15	.06	.06	.08
Centered sexual relationship power			–.32***	–.31***	–.33***
Centered sexual self-schema				–.08	–.02
Interaction: centered sexual relationship power × centered sexual self-schema					–.26**
F	6.43***	8.07***	9.50***	8.23***	8.98***
R^2	.17	.30	.38	.38	.44
Adjusted R^2	.14	.26	.34	.34	.39
R^2 change	.17***	.13***	.08***	.01	.06**

Gynecological/rectal cancer: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

Mediation Effects of Sexual Self-Schema using Path Analysis

In the related literature reviews in Chapter 2, sexual self-schema was demonstrated to be a moderator. However, the consideration of sexual self-schema as a mediator was exploratory in this study to explain the extent to which sexual self-schema accounted for the relationships among the independent variables of body image, anxiety and depression, and sexual relationship power, as well as the outcomes of sexual function and sexual satisfaction. The path analyses used the multiple regression strategies to calculate the path coefficients. The path coefficients in Figure 4.4 and Figure 4.5 were the beta weights related to the independent variables in the multiple regression analyses for the dependent variables of sexual function and sexual satisfaction. Data from 104 women with gynecological/rectal cancer and without any cancer who completely finished the BIS, HADS, SRPS, SSS, FSFI and ISS were included; therefore, the sample size for regression equations was the same. Finally, the online Sobel test calculator was used to test whether sexual self-schema as a mediator significantly influenced the independent variables (body image, anxiety and depression, and sexual relationship power) or the dependent variables (female sexual function and sexual satisfaction).

Figure 4.4 shows the results of two simultaneous regression analyses. One was for the sexual function variable with the direct predictors of body image, anxiety and depression, sexual relationship power, and sexual self-schema, F (4, 99) = 5.65, $p < .001$. The other one was for the sexual self-schema variable with the direct predictors of body image, anxiety and depression, and sexual relationship power, F (3, 100) = 2.53, $p = .06$; however, this model didn't significantly fit the overall data well. Only one of three

predictors of sexual self-schema yielded a significant beta weight (β = –.23, p < .05), and body image, anxiety and depression, and sexual relationship power predicted 7% of the variance of sexual self-schema. In addition, body image was also a significant predictor for sexual function (β = –.30, p < .01). Nineteen percent of the variance in sexual function was accounted for by four predictors: body image, anxiety and depression, sexual relationship power, and sexual self-schema. However, sexual self-schema, with a beta weight of .07, was not significantly related to sexual function (p > .05). The path coefficients are shown in Figure 4.4 and can also be seen in the data in Table 4.28. The specific calculations specified by Wright's rules are depicted in Table 4.29. Further, results of the Sobel test revealed that the indirect effects of body image, anxiety and depression, and sexual relationship power through sexual self-schema on female sexual function were not statistically significant at .05 level of significance (Table 4.30).

In Figure 4.5, two simultaneous regression equations were conducted to detect the effects of the mediations of sexual self-schema on sexual satisfaction. The first regression analysis was focused on the dependent variable of sexual self-schema, F (3, 100) = 2.53, p = .06. Only body image was identified as a significant cause of sexual self-schema (β = –.23, p < .05). The second regression analysis was conducted for sexual satisfaction with 26% of the variance, F (4, 99) = 8.70, p < .001. There were four predictors hypothesized to be associated with sexual satisfaction, including body image, anxiety and depression, sexual relationship power, and sexual self-schema. Body image (β = .32, p < .01) and sexual relationship power (β = –.23, p < .05) served as significant direct independent variables in this regression equation. However, sexual self-schema was not significantly

related to sexual satisfaction (β = .002, p > .05). The data of the path coefficients are demonstrated in Figure 4.5 and Table 4.28. In addition, Wright's rules were used to calculate the specific calculations and the results are shown in Table 4.31. Finally, Sobel tests for sexual self-schema through body image, anxiety and depression, and sexual relationship power to sexual satisfaction were not significant at a .05 level of significance (Table 4.32).

Figure 4.4 Mediation Effects of Sexual Self-Schema for Sexual Function

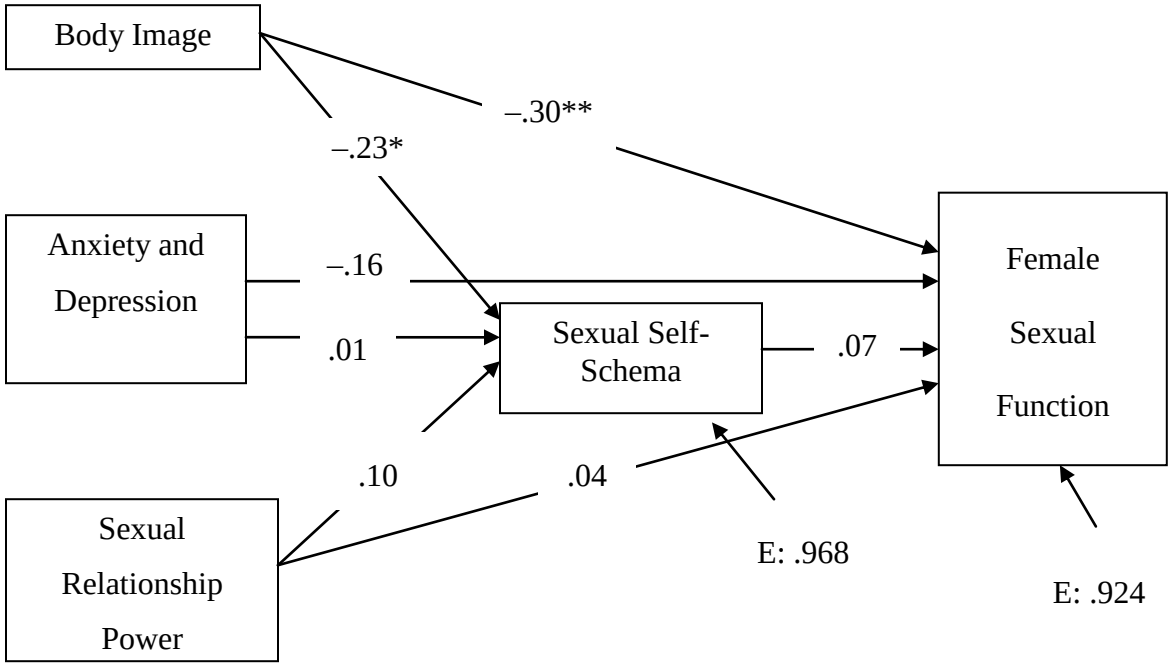


Table 4.28 Regression Analysis for Female Sexual Function, Sexual Self-Schema, and Sexual Satisfaction (n = 104)

Dependent Variables	Predictors	*b* (*SE*)	*β*	*t*	*p*
Female sexual function	Body image	–.40 (.14)	–.30	–2.84	<.01
	Anxiety and depression	–.27 (.17)	–.16	–1.56	>.05
	Sexual relationship power	1.02 (2.61)	.04	.39	>.05
	Sexual self-schema	.05 (.06)	.07	.74	>.05
Sexual self-schema	Body image	–.46 (.22)	–.23	–.212	<.05
	Anxiety and depression	.03 (.27)	.01	.11	>.05
	Sexual relationship power	3.84 (4.08)	.10	.94	>.05
Sexual satisfaction	Body image	.80 (.25)	.32	3.23	<.01
	Anxiety and depression	.38 (.30)	.13	1.29	>.05
	Sexual relationship power	–11.16 (4.54)	–.23	–2.46	<.05
	Sexual self-schema	.002 (.11)	.002	.02	>.05

Table 4.29 Direct Effects, Indirect Effects, and Spurious Associations Related with Independent Variables in Figure 4.4

Paths	Direct Effects	Indirect Effects	Total Effects	Spurious Associations	Total Correlations
Body image, sexual self-schema	–.23	0	–.23	0	–.23
Anxiety and depression, sexual self-schema	.01	0	.01	0	.01
Sexual relationship power, sexual self-schema	.10	0	.10	0	.10
Sexual self-schema, sexual function	.07	0	.07	.07	.14
Body image, sexual function	–.30	–.02	–.32	0	–.32
Anxiety and depression, sexual function	–.16	.0007	–.16	0	–.16
Sexual relationship power, sexual function	.04	.007	.05	0	.05

Table 4.30 Results of Sobel Test for Female Sexual Function as Dependent Variable (*n* = 104)

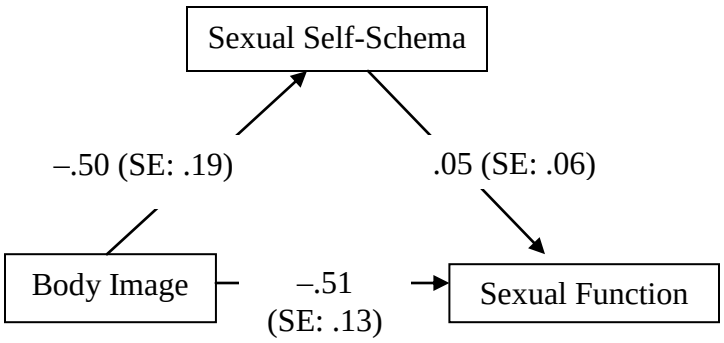
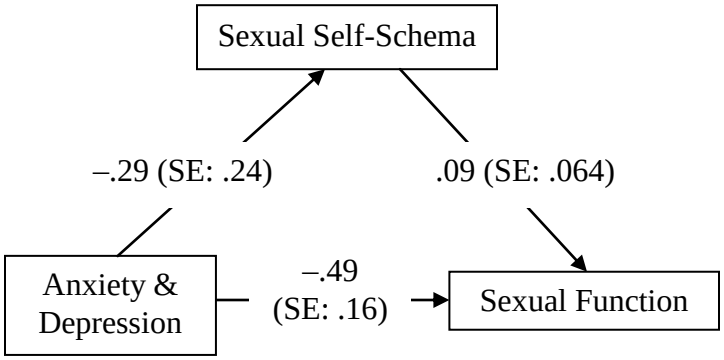
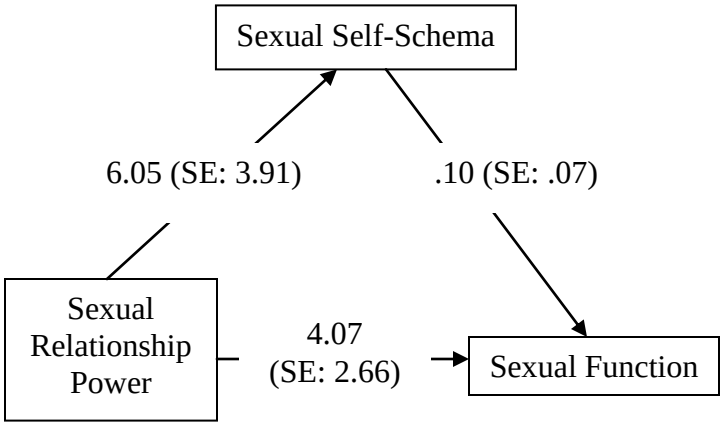
Paths	Sobel Test	Significance (two-tailed)
	–.79	.43 (>.05)
	–.94	.35 (>.05)
	1.05	.29 (>.05)

Figure 4.5 Mediation Effects of Sexual Self-Schema for Sexual Satisfaction

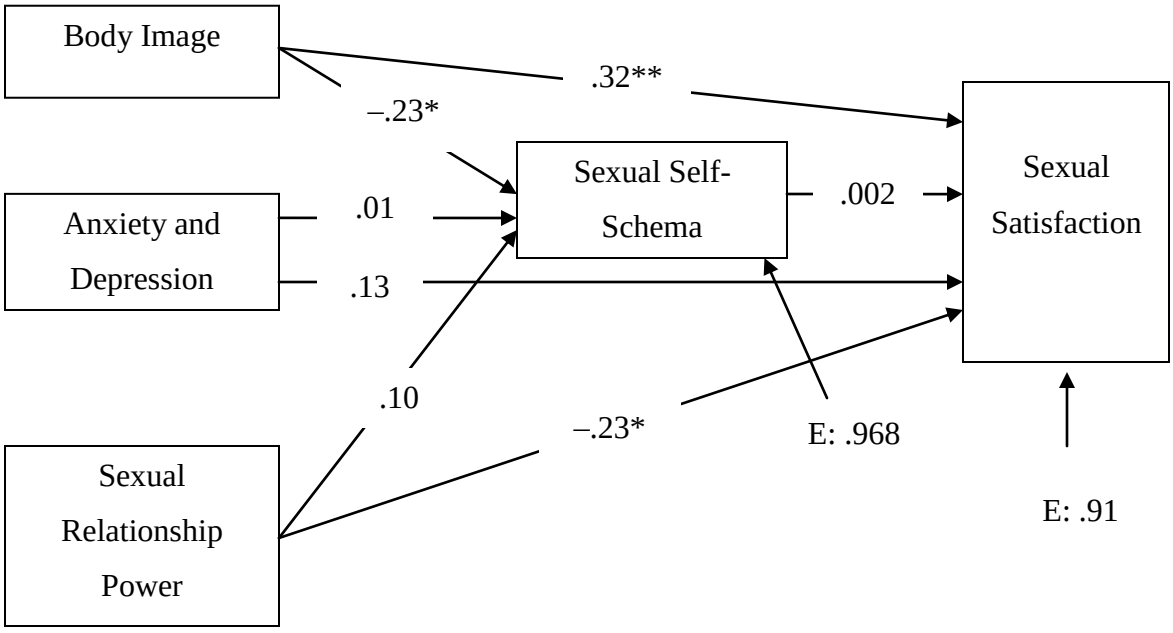
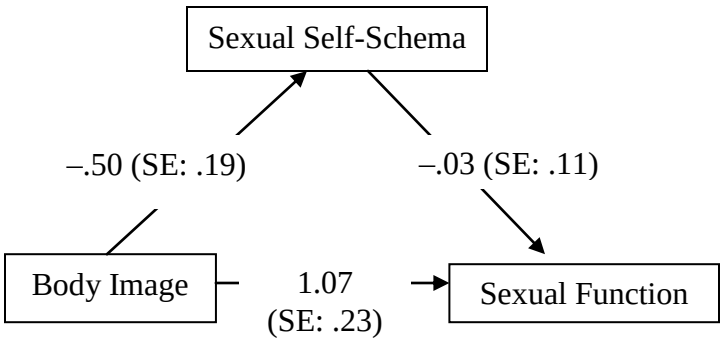
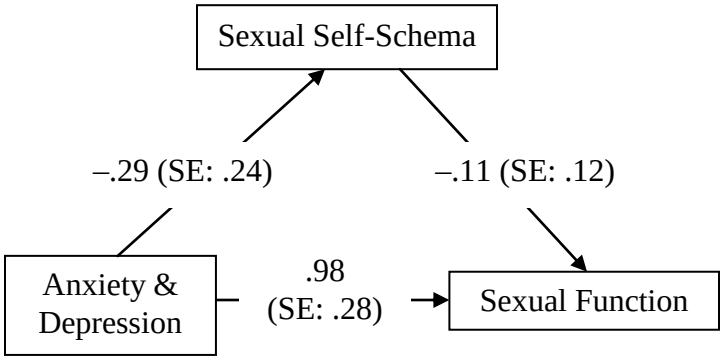
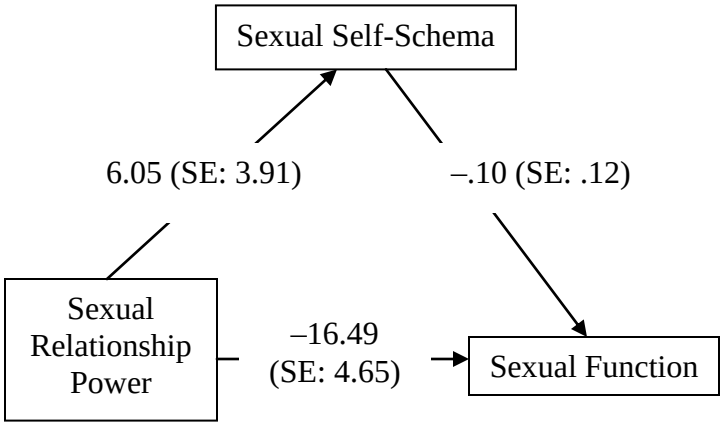


Table 4.31 Direct Effects, Indirect Effects, and Spurious Associations Related with Independent Variables in Figure 4.5

Paths	Direct Effects	Indirect Effects	Total Effects	Spurious Associations	Total Correlations
Body image, sexual self-schema	–.23	0	–.23	0	–.23
Anxiety and depression, sexual self-schema	.01	0	.01	0	.01
Sexual relationship power, sexual self-schema	.10	0	.10	0	.10
Sexual self-schema, sexual satisfaction	.002	0	.002	–.095	–.09
Body image, sexual satisfaction	.32	–.00046	.32	0	.32
Anxiety and depression, sexual satisfaction	.13	.00002	.13	0	.13
Sexual relationship power, sexual satisfaction	–.23	.0002	–.23	0	–.23

Table 4.32 Results of Sobel Test for Female Sexual Satisfaction as Dependent Variable (n = 104)

Paths	Sobel Test	Significance (two-tailed)
	.27	.79 (>.05)
	.73	.47 (>.05)
	–.73	.46(>.05)

Research Question 4

What are the differences in female sexual function and sexual satisfaction between females with rectal/gynecological cancer and females without any cancer?

An intercorrelation was found between the two dependent variables of female sexual function and sexual satisfaction; therefore, multivariate analysis of variance (MANOVA) was used to examine relationships between sexual function and sexual satisfaction and to test the differences between the study and comparison groups. However, sexual function and satisfaction are age-related issues, and there was a significant difference of age between the study and comparison groups. Therefore, MANCOVA was used by controlling the age as a covariate in order to explore the differences of female sexual function and sexual satisfaction between women with gynecological/rectal cancer and those without any cancer. In this section, the researcher described the results of the scores of female sexual function and sexual satisfaction first. Then, the assumptions in two-group multivariate analysis of variance were explored before conducting MANCOVA test.

Female Sexual Function

The total FSFI score ranged from 2 to 36 with a mean of 16.12 for the study group and 24.91 for the comparison group; high scores mean good sexual function. Eighty-five percent of the women in the study group suffered sexual dysfunction, compared with 44% in the comparison group. Table 4.33 and Table 4.34 present the results of the FSFI. Further, women with gynecological or rectal cancer perceived statistically significant

lower levels of sexual desire, lubrication, orgasm, satisfaction, and pain compared with women without any cancer after controlling the covariate of age (Table 4.35).

Internal consistency (Cronbach's alpha) for the total FSFI was .98 for the study group, which was the same as for the comparison group in this study. Reliability coefficients of the FSFI subscales, including sexual desire, arousal, lubrication, orgasm, satisfaction, and pain, ranged from .88 to .98 for the study group and from .88 to .98 for the comparison group. The findings related to internal consistency of the FSFI scale are summarized in Table 4.36.

Table 4.33 Descriptive Statistics for Female Sexual Function for Women with Gynecological/Rectal Cancer and Women Without Any Cancer

	Study Group (n = 53–55)			Comparison Group (n = 71–72)		
Variable	Mean	SD	Range	Mean	SD	Range
Female sexual function	16.12	10.13	2–36	24.91	9.49	2.6–36
Desire	4.15	2.08	2–10	5.85	1.91	2–10
Arousal	9.00	7.02	0–20	13.14	6.37	0–20
Lubrication	7.78	6.58	0–20	14.17	7.27	0–20
Orgasm	6.96	5.48	0–15	10.21	5.32	0–15
Satisfaction	7.83	4.45	2–15	11.24	4.04	2–15
Pain	5.73	5.49	0–15	11.04	5.63	0–15

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.34 Frequencies of Sexual Function and Dysfunction for Women with Gynecological/Rectal Cancer and Women Without Any Cancer

	Study Group (*n* = 53)		Comparison Group (*n* = 71)	
Variable	*n*	%	*n*	%
Sexual function	8	15.1	40	56.3
Sexual dysfunction	45	84.9	31	43.7

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.35 Analyses of Covariance for Female Sexual Function and Sexual Satisfaction After Removal of Covariate Influence of Age

	Study Group (*n* = 51–55)	Comparison Group (*n* = 66–72)		
Variable	Mean	Mean	*F*	*p*-value
Female sexual function	17.48	23.90	9.26	.003
Desire	4.31	5.73	10.99	.001
Arousal	9.87	12.47	3.33	.07
Lubrication	8.96	13.27	8.51	.004
Orgasm	7.43	9.86	4.34	.04
Satisfaction	8.27	10.91	8.29	.005
Pain	6.23	10.66	13.65	.000
Sexual satisfaction	36.83	24.49	10.07	.002

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.36 Reliability of the Female Sexual Function Index

		Internal Consistency		
		Full Sample	Study Group	Comparison Group
Scale	# Items	Alpha (*N*)	Alpha (*n*)	Alpha (*n*)
Desire	2	.95 (127)	.94 (55)	.94 (72)
Arousal	4	.97 (127)	.98 (55)	.96 (72)
Lubrication	4	.98 (127)	.96 (55)	.98 (72)
Orgasm	3	.96 (127)	.96 (55)	.97 (72)
Satisfaction	3	.90 (124)	.88 (53)	.88 (71)
Pain	3	.96 (127)	.94 (55)	.97 (72)
Total	19	.98 (124)	.98 (53)	.98 (71)

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Sexual Satisfaction

The mean of ISS scores was 37.37 (SD = 21.13) and ranged from 0 to 80 for the study group; the comparison group had a mean of 24.08 (SD = 14.28) and a range of 1–70; high scores mean low levels of sexual satisfaction. In addition, 62% of the participants with gynecological or rectal cancer perceived sexual dissatisfaction compared with 23% for the participants without cancer. Table 4.37 presents the frequencies for sexual satisfaction and dissatisfaction. Further, women with gynecological/rectal cancer reported statistically significant worse sexual satisfaction than women without any cancer after controlling the participants' ages (Table 4.35).

Internal consistency (Cronbach's alpha) for the total ISS was .95 for the study group and .94 for the comparison group in this study. The findings related to internal consistency of the ISS scale are summarized in Table 4.38, and the discriminant validity of the ISS can be seen in Table 4.39. Discriminant validity was assessed by comparing the mean responses of women with sexual dysfunction with those of women without sexual dysfunction in this study. As shown, the statistically significant difference between the two groups was observed for the full ISS scale score. Therefore, the means and the significant difference have shown that the ISS has the ability to distinguish between the two groups of women.

Table 4.37 Frequencies of Sexual Satisfaction and Dissatisfaction for Women with Gynecological/Rectal Cancer and Women Without Any Cancer

	Study Group (*n* = 52)		Comparison Group (*n* = 69)	
Variable	*N*	%	*n*	%
Sexual satisfaction	20	38.5	53	76.8
Sexual dissatisfaction	32	61.5	16	23.2

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.38 Reliability of the Index of Sexual Satisfaction

		Internal Consistency		
		Full Sample	Study Group	Comparison Group
ISS scale	# Items	Alpha (*N*)	Alpha (*n*)	Alpha (*n*)
Total	25	.95 (124)	.95 (52)	.94 (72)

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Table 4.39 Discriminant Validity of the Index of Sexual Satisfaction (ISS)

	ISS scores				
	Mean	Standard Deviation	*t*-test	*df*	*p*
Problem group (*n* = 73)	38.21	18.33	–8.82	109.83	<.001
No-problem group (*n* = 47)	16.26	8.65			

Problem Group = Women with sexual dysfunction (a total score of FSFI ≦ 26.55)
No-Problem Group = Women without sexual dysfunction (a total score of FSFI ＞ 26.55)

Assumptions in Two-Group Multivariate Analysis of Covariance

The assumptions about the data were tested before generalizing the results of the two-group MANCOVA. The assumptions for using MANCOVA are outliers, independence of participants, multivariate normality, homogeneity of variance-covariance matrices, and linearity (Meyers, Gamst, & Guarino, 2006).

Outliers. The assumption of the outliers was tested by z-scores (standardized values) for absolute values greater than 2.58. In the scores on ISS, one case for the study group had an outlying value. No cases of outlying scores on the Female Sexual Function

Index (FSFI) were identified for either the study or the comparison group. Therefore, the one case was eliminated in the ISS due to an outlying value.

Independence. The assumption of the independence of participants was met. Participants completed the questionnaires separately at their personal residences. Therefore, each participant was unaffected by other participants.

Normality. The assumption of normality was tested by examining the Q-Q plots, the Kolmogorov-Smirnov and the Shapiro-Wilk tests, and the skewness and kurtosis statistics. Table 4.33 shows that some of the normality tests (Kolmogorov-Smirnov and the Shapiro-Wilk) were statistically significant (even with a stringent alpha level of $p <$ .001), indicating some normality violations for FSFI in the comparison group. The skewness and kurtosis statistics were not all within the –1 to +1 range (Table 4.40). However, the normal Q-Q plots in Figure 4.6 look reasonably normal.

Linearity. The assumption of linearity was tested by examining the shape of the bivariate scatter plots for the variables of FSFI and ISS. The scatter plot appeared to depict enough linearity in the relationship of ISS and FSFI, although it is not a perfect oval.

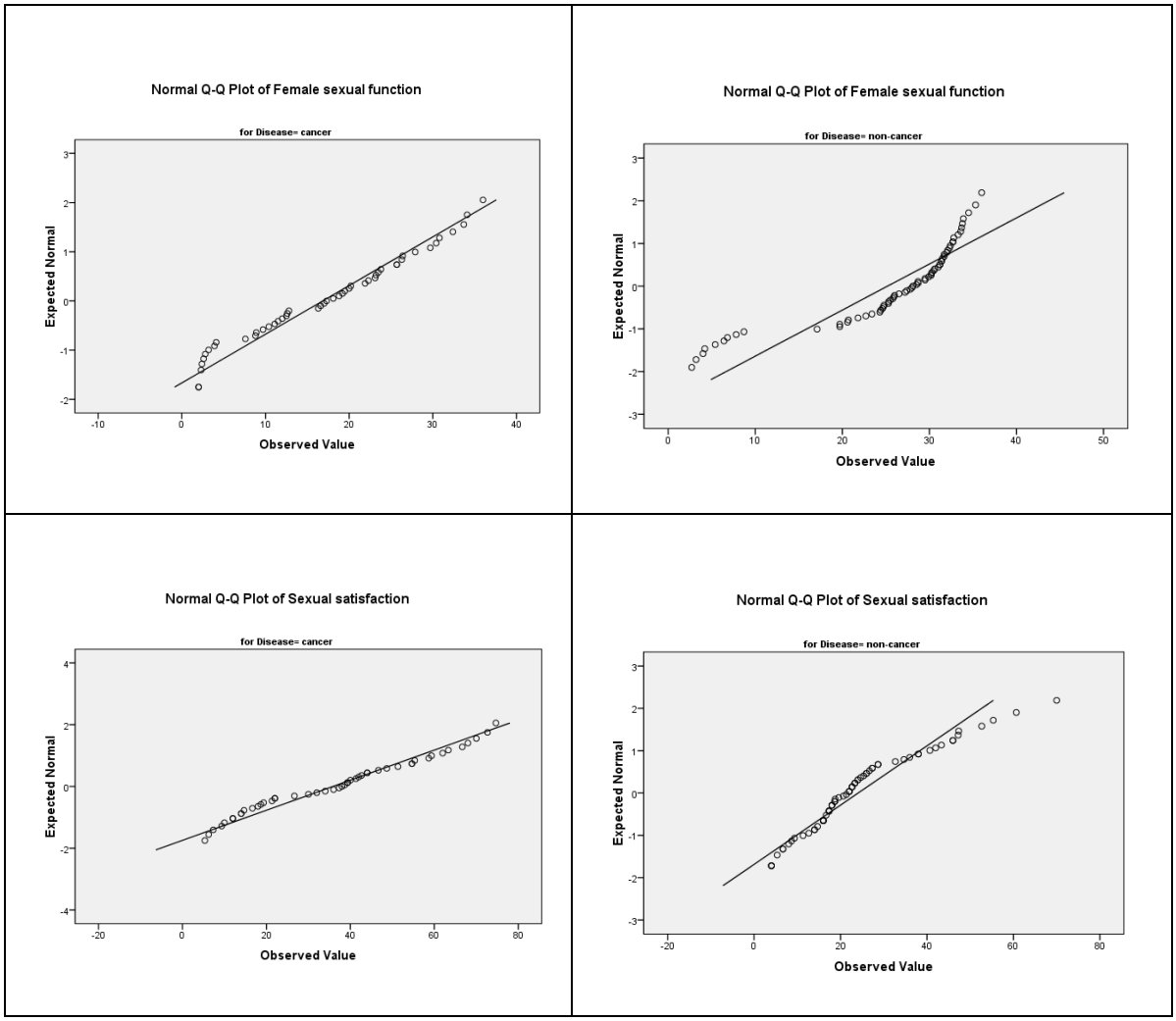
Table 4.40 Normality Tests of FSFI and ISS, by the Study and Comparison Groups

		Study Group (n = 49)		Comparison Group (n = 69)	
		Statistic	Significance	Statistic	Significance
FSFI	Normality test				
	Kolmogorov-Smirnov	.10	.20	.20	.000
	Shapiro-Wilk	.95	.04	.81	.000
	Skewness	.06		–1.37	
	Kurtosis	–1.07		.79	
ISS	Normality test				
	Kolmogorov-Smirnov	.12	.09	.15	.001
	Shapiro-Wilk	.96	.10	.93	.001
	Skewness	.14		1.01	
	Kurtosis	–1.04		1.00	

Study Group = Women with gynecological/rectal cancer

Comparison Group = Women without any cancer

Figure 4.6 Normal Q-Q Plots of FSFI and ISS for Women with Gynecological/Rectal Cancer and Women without Cancer



Homogeneity. The assumption of homogeneity of covariance matrices for FSFI and ISS across the study and comparison groups was assessed by the Box's M test. The result of the Box's M test of the equality of variance-covariance was not statistically significant ($F = 2.58$, $p > .05$), indicating that the assumption was not violated. However, the Levene's test was significant for the dependent variable of sexual satisfaction ($p < .05$), indicating that the group variance was not equal (Table 4.41). The double-check was conducted by dividing the highest variance by the smallest one, and the resulting value, which was 2.0, was not greater than the critical value ,which is approximately 2 or 3 (Field, 2009). Therefore, the data were ready for analysis.

Table 4.41 Tests of Equality of Covariance Matrices and Equality of Error Variances of Two Variables of FSFI and ISS

	Overall		FSFI		ISS	
	Statistic	Significance	Statistic	Significance	Statistic	Significance
Box's M	7.89	.052				
Levene's			3.55	.06	12.86	.000

Two-Group Multivariate Analysis of Covariance

Bartlett's test of sphericity was shown to be statistically significant, indicating that there was sufficient correlation between the two dependent variables of FSFI and ISS. Further, a moderately negative relationship ($r = –.69$, $p < .001$) was observed between FSFI and ISS (Table 4.42). Therefore, the results of the multivariate test required review.

Using Wilks' lambda test, there was a statistically significant effect of having gynecological/rectal cancer on female sexual function and sexual satisfaction, $\lambda = .96$, $F(2, 114) = 4.75$, $p = .01$. The results of the multivariate test are shown in Table 4.43. In addition, Table 4.43 also depicts a partial eta-squared value of .08, indicating that nearly 8% of the variance in the combined dependent variables of female sexual function and sexual satisfaction was accounted for by having gynecological or rectal cancer. However, there was not a significant effect of the covariate, age, on female sexual function and sexual satisfaction, $F(2, 114) = 2.69$, $p = .07$.

The multivariate effect was present; therefore, the univariate ANOVAs were conducted separately on each dependent variable to determine the locus of the statistically significant multivariate effect. Further, a Bonferroni adjustment was performed to determine the alpha level (.05/2 = .025) in order to control for alpha inflation. Evaluating the *F* tests with the corrected alpha level indicates that both were statistically significant ($p < .025$). As shown in Table 4.44, having gynecological or rectal cancer significantly affected female sexual function, $F(1, 115) = 7.86$, $p < .001$, and sexual satisfaction, $F(1, 115) = 7.94$, $p < .001$. It appears that women with gynecological

or rectal cancer reported significantly poorer female sexual function and sexual satisfaction than women without any cancer. However, separate univariate ANOVAs on the outcome variables revealed nonsignificant effects of the covariate, age, on female sexual function and sexual satisfaction.

For planned contrasts, the results showed that women with gynecological/rectal cancer had significantly worse sexual function, $t = 2.08$, $p = .006$, and sexual satisfaction, $t = –2.82$, $p = .006$, compared with women without any cancer.

Table 4.42 Test of Intercorrelation of Two Variables of FSFI and ISS

	Statistic	Significance
Bartlett's test of sphericity	100.12	<.001
Pearson correlation: FSFI by ISS	–.69	<.001

Table 4.43 Multivariate Test Results

Effect	Multivariate Test	Value	*F*	Significance	Partial Eta Squared
Age	Wilks' lambda	.96	2.69	>.05	.05
Having gynecological/ rectal cancer or not	Wilks' lambda	.92	4.75	<.01	.08

Table 4.44 Univariate Test Results for Two Variables of FSFI and ISS

	Dependent Variables	*F*	Significance
Corrected Model	Female sexual function	13.07	.000 (<.025)
	Sexual satisfaction	6.74	.002 (<.025)
Age	Female sexual function	4.02	.047 (>.025)
	Sexual satisfaction	.16	.694 (>.025)
Gynecological/rectal cancer	Female sexual function	7.86	.006 (<.025)
	Sexual satisfaction	7.94	.006 (<.025)

Additional Analysis

The Final Model Testing for Sexual Function

According to the results of Question 3, sexual self-schema was a moderator that influenced the strength of the relationship between sexual relationship power and sexual function (Table 4.26). Further, the only significant variables associated with sexual function in Question 3 were selected and put in a new hierarchical multiple regression analysis. Regression results are summarized in Table 4.45. Multiple *R* for regression was statistically significant: $F(5, 103) = 13.63$, $p < .001$. This model explained 40% of the variance in female sexual function after controlling for having gynecological/rectal cancer, body image, sexual relationship power, and sexual self-schema. Three of the five independent variables contributed significantly to the outcome of female sexual function ($p < .05$).

Table 4.45 Hierarchical Multiple Regression for the Predictors and the Outcome of Sexual Function (n = 109)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)
Gynecological/rectal cancer	–.44***	–.35***	–.36***	–.42***	–.40***
Body image		–.33***	–.31***	–.24*	–.18*
Centered sexual relationship power			.06	.06	.11
Centered sexual self-schema				.22*	.16
Interaction: centered sexual relationship power × centered sexual self-schema					.27**
F	25.40***	21.72***	14.58***	13.16***	13.63***
R^2	.19	.29	.29	.34	.40
Adjusted R^2	.18	.28	.27	.31	.37
R^2 change	.19***	.10***	.00	.04*	.06**

Gynecological/rectal cancer: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

The Final Model Testing for Sexual Satisfaction

In Question 3, sexual self-schema was a moderator that influenced the direction of the relationship between sexual relationship power and sexual satisfaction (Table 4.27). According to the final model for sexual satisfaction in Question 3, the significant variables were chosen to test a new hierarchical multiple regression, and the results of this regression are presented in Table 4.46. The interaction term of sexual relationship power and sexual self-schema was entered in the fifth model and accounted for an additional 5% of the variance ($p < .01$). The six models accounted for 58% of the variance in overall sexual satisfaction. In this final model, sexual relationship power and female sexual function accounted for significant portions of the variance. Having gynecological/rectal cancer, body image, sexual self-schema, and the interaction term of sexual relationship power and sexual self-schema were not significantly related to overall sexual satisfaction.

Table 4.46 Hierarchical Multiple Regression for the Predictors and the Outcome of Sexual Satisfaction (n = 105)

Predictor Variables	Model 1 (β)	Model 2 (β)	Model 3 (β)	Model 4 (β)	Model 5 (β)	Model 6 (β)
Gynecological/rectal cancer	.38***	.30***	.34***	.37***	.34***	.12
Body image		.35***	.26**	.23*	.19*	.11
Centered sexual relationship power			–.30***	–.30***	–.32***	–.25***
Centered sexual self-schema				–.11	–.05	.02
Interaction: centered sexual relationship power × centered sexual self-schema					–.25**	–.13
Female sexual function						–.52***
F	17.83***	18.23***	17.88***	13.86***	13.76***	22.34***
R^2	.15	.26	.35	.36	.41	.58
Adjusted R^2	.14	.25	.33	.33	.38	.55
R^2 change	.15***	.12***	.08***	.01	.05**	.17***

Gynecological/rectal cancer: 1 = Yes, 0 = No;

*$p \leqq 0.05$, **$p \leqq 0.01$, ***$p \leqq 0.001$ (all 2-tailed)

The Results of the Qualitative Data

A content analysis was done to describe the additional qualitative content: writing in the margins of the questionnaires as well as e-mails, notes, and letters. The data were collected from 26 women with gynecological or rectal cancer in the study group; however, no women who had no cancer provided any comments. The qualitative data were read at least five times to get a sense of the whole picture of the data. Furthermore, in accordance with the purposes of the study, the meaning units were selected and condensed. The units were divided into five categories based on similar content, and the categories were compared and sorted into two themes (Table 4.47). The qualitative results were used to support the results of the quantitative research questions.

Table 4.47 Overview of Themes and Categories in the Findings

Themes	Categories
Changes of sexual life	Alteration of the body
	Becoming painful
	Maintaining intimate relationships
A thirst for sexual information	Not being informed
	Treatments are desperate

Changes in Sexual Life

In the fourth research question (Table 4.35), the results showed that women with gynecological or rectal cancer reported significantly worse body image, sexual function— especially for sexual lubrication and sexual pain—and sexual satisfaction than women without any cancer. The women felt the changes in their bodies after the surgery and treatment, and those changes caused them to have sexual dysfunction and sexual dissatisfaction. However, they tried hard to maintain their intimate relationships with their partners even though they suffered those sexual difficulties.

Alteration of the body

Women with gynecological cancer reported that the surgery and radiotherapy caused their vaginas to become "small," "tightened," "thin," and "shorter"; some noted that they even had "scar tissue." These changes had an extreme effect on their sexual function. In addition, the radiation affected the function of the participants' anal sphincters, which had an impact on their quality of life. In addition, the cancer surgery and treatments had effects not only on the participants' physical status but also on their psychological status. One of the women expressed that she felt "neuter" after all her female organs were removed. Another patient even felt that she had been betrayed by her body. One woman with gynecological cancer expressed the following: "I worked very hard on my body image issues, my physical restrictions (small vagina, no lubrication, endless hot flashes, night sweats, and other menopause issues). I tried repeatedly to have orgasms through intimacy with my husband and through masturbation."

Another woman with rectal cancer said this:

> But the radiation damaged my anal sphincter. Anyway, so now I cannot keep my feces in. When I have to go, I HAVE to go! Because I go anyway. I wore diapers for a long time and had several horrid "accidents" at work when I could not get to a bathroom in time. I have learned to be very aware of my elimination needs and function well, but need to plan carefully so as not to have "accidents." But I am grateful not to have a bag! And I AM alive.… That is a great plus."

A third expressed other effects of the surgery and treatments on psychological status:

> The worst part of cancer is the feeling that your body, your very self, has betrayed you. And being afraid every day that it might come back, maybe someplace else. And trying so hard to be cheerful and upbeat and positive, when that used to be my normal.

Becoming painful

The women described how sexual intercourse became painful because of the changes in the structures of the vagina and the effects of menopause on their hormones after the surgery and treatments. Some of them expressed that intercourse had been "incredibly painful," and some said that they had "not attempted intercourse." One woman explained that she could always reach orgasm but not through intercourse.

One woman with gynecological cancer said,

> After surgery, I was shocked the first time my husband and I tried to have sex. The pain was like nothing I'd ever experienced during sex. No one mentioned the

> changes in my vagina. I felt like a twelve-year-old girl trying to have intercourse. I was so tight and my vagina so small; I was in excruciating pain. I had a temporary colostomy so I was self-conscious to begin with and then to experience this shock was frightening. It took a very long time (over a couple of weeks) before I could handle complete penetration. I had to purchase lubricants and use them faithfully or I would suffer terribly during intercourse.

Another woman expressed,

> We have not had sex since my diagnosis. Within three weeks from diagnosis, I had a port surgically implanted and was in chemo and radiation. No surgery, but I was quite unwell and very upset (physically as well as emotionally). Radiation made even urinating extremely painful; there was no question of sex! And as time went on, my vagina tightened so painfully that even getting a pap smear is now not physically possible, never mind sex.

Maintaining the intimate relationship

One participant shared a story about one patient who decided to opt out of treatment because of the prospect of a disappointing sexual life for her and her husband even if she beat the cancer. The story showed that intimacy plays an important role in the relationship with the partner, and this relationship was a source of support for the women in overcoming the disease or continuing the treatments. Some women tried to do other things instead of having sexual intercourse, such as "having fun talking about sex," and

some of them still had sexual intercourse. However, some women reported that they and their partners had broken up during the treatment.

One participant said, “I still have regular sex with my husband and I feel the intimacy is crucially important to any relationship, but honestly, the fun and joy of it, I mostly fake.” A second offered,

> I have wept frequently over the loss of my sexuality – Can’t even bring myself to use it. My tissues are thin and painful. There’s now less talking, less cuddling, less foreplay, less postcoital interaction, less satisfaction and relaxation. And what’s most frustrating is that he doesn’t see/feel it. To him there’s no problem and I feel all the loss and sadness.

And a third said,

> I get the feeling (though he will not discuss it) that my husband sees me nonsexually now. He is loving and thoughtful and considerate, but no touching. Must admit I miss it, as initially our lives together were very sexual in nature, and I thought it would not, could not last. We have been married 34 years now, we have a mutual son whom we both adore, [and] we are very good friends and share all other aspects of our lives.

A Thirst for Sexual Information

The women experienced the changes in their bodies after the surgery and treatments that caused the sexual dysfunction. The participants expected to be informed about the changes of sexual function after the cancer surgery and treatments and hoped to

receive appropriate sexual treatment. Two categories were identified under the theme of a thirst for sexual information, including "not being informed" and "treatments are desperate."

Not being informed

Some of the participants expressed that they were not informed about the prospective changes in sexual function; therefore, they could not mentally prepare or equip themselves. The only thing the health care providers focused on was helping the patients survive the cancer through surgery and treatments. Their sexual lives were easily forgotten during the process of the surgery and treatments. However, the sexual life is an important factor in quality of life, as a participant noted: "Due to radical debulking twice, an ostomy, reversal, no hormones etc., lubrication is nonexistent. This is a highly overlooked part of the patient's QOL [quality of life] by physicians."

Another participant said,

> I have been very frustrated with the "medical community's" view on this very issue. It angers me to hear young nurses and male doctors speak as "sex experts" on this topic, claiming sex is just as wonderful and satisfying (even better) than before the hysterectomy. None of them have been through these surgeries or even menopause.

A third participant offered these thoughts:

> I actually feel as though therapy should be provided after your surgery and treatments so that you are able to be better equipped to handle the change in your

> sex life. During the onset of treatments and surgeries, you are only concerned about one thing: SURVIVAL! It never occurs to you that you/and your partner will suffer sexually until later. And no one warns you of it either.

Treatments are desperate

The participants experienced sexual pain and dryness, resulting in their having no sexual activity, no interest in sex, and no libido at all. However, they were not informed about those changes during or after the surgery and treatment. Therefore, some of the participants searched for help from health care providers and got some sexual treatments, including using KY™ jelly at the start of intercourse, vaginal estrogen, dilators, lubricant, or hormones. However, not all of the treatments worked well for the participants.

One participant shared her experience, saying,

> My doctors (males, all) did a sort of "whoops"—they never told me I should use a dilator regularly to preserve future sexual function.… I now have a female oncologist (talk about closing the barn door after the horse has gotten out!). She has given me dilators and told me that diligent use will reopen the passage, but it hurts so much to try that I have given up.

Another participant said,

> I am always preaching that doctors need to talk with their patients about sexual activity and function and frankly believe I would have had earlier diagnosis and this better prognosis if my gynecologist had not been shy about such topics… Specifically, when I expressed concern about possible loss of lubrication and

> elasticity, discussion would have revealed I was having very painful intercourse. But my gynecologist just handed me a lubricant sample, and I left thinking my experience was a natural part of aging that I would need to accept.

And a third woman said how the hormone therapy worked for her,

> Ten years after my first surgery, I decided to try bio-identical hormones. This did help considerably. I noticed color returning to my nipples, my pubic hair came back (the balding was horrible and embarrassing), and my vagina became moist. All of these things made sex better for me. Not so much pain and the dryness inside my vagina is no longer a problem.

From these women's narratives, we learned that most women identified themselves as heterosexual, were mostly married or in a permanent relationship, and had had sexual intercourse with their partners before being diagnosed with the disease. However, cancer and its related treatments caused changes to their bodily structures, including but not limited to the loss of lubrication; a vagina that became small, thin, or less elastic; color changes of nipples; and loss of pubic hair. These physical changes significantly influenced the women's sexual lives, especially regarding sexual intercourse. However, in hierarchical societies, women have historically had sexual intercourse with their partners to help them maintain their intimate relationships. Women used to meet their partners' sexual needs in order to gain love and maintain their affection. After being treated for their diseases, some women in this study expressed that they could not have sexual intercourse with their partners or achieve sexual orgasm as easily as before, and these changes actually had an impact on their intimate relationships

with their partners. Moreover, one woman expressed that her sexual orgasms were mostly fake in an effort to meet her husband's needs. In addition, health care providers (mostly male physicians) neglected these significant changes in women's sexual functions after the disease. When women raised their sexual concerns with their health care providers, the women still could not get satisfactory treatments because the health care providers generally treat physical problems and tend to neglect psychological and relationship issues. However, relationships with their partners and the women's psychological status were critical parts of their sexuality. In sum, these women's voices echo radical feminists' views of women and sexuality.

Summary

This chapter contains the results of data analysis for this study. Tests of the research questions that analyzed the relationships among body image, anxiety and depression, sexual relationship power, sexual self-schema, sexual function, and sexual satisfaction were described. The differences of means of body image, anxiety and depression, sexual relationship power, sexual self-schema, sexual function, and sexual satisfaction between the study and comparison groups were explored. Further, unsolicited qualitative data pertaining to what the participants with gynecological or rectal cancer expressed in their comments or experiences were also presented. The quantitative findings showed that sexual relationship power and sexual function had significant effects on sexual satisfaction, which supported the radical feminism viewpoint that sexual equality and physical sexual function play important roles in sexual relationships between

the sexes. In addition, the qualitative findings also showed that women with gynecological or rectal cancer were concerned about their sexual function because they wanted to maintain intimate relationships with their partners.

Chapter 5: Summary, Discussion, Implication, and Recommendations

This chapter includes five parts. The first presents a summary of the study, including the purpose, conceptual framework, research questions, methodology, data analysis, and findings. The second part addresses the discussions related to the research questions and additional findings, and the third part discusses the limitations of this study. The fourth part summarizes the conclusions drawn from the study, and the fifth part delineates the implications and recommendations for nursing practice, nursing education, and further nursing research.

Summary of the Study

Purpose

This descriptive, comparative, and correlational study explored the relationships among body image, anxiety and depression, sexual self-schema, sexual relationship power, female sexual function, and sexual satisfaction; tested sexual self-schema as a moderator or mediator on female sexual function and sexual satisfaction; and compared the differences in female sexual function and sexual satisfaction between women with gynecological/rectal cancer and those without any cancer.

Conceptual Framework

The study was guided by a theoretical framework compiled from personal information, body image, anxiety and depression, sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction. Personal information, including

demographic characteristics, health histories, and disease characteristics, would influence not only body image, anxiety and depression, and sexual relationship but also the dependent variables of female sexual function and sexual satisfaction. The relationships among body image, anxiety and depression, and sexual relationship power were also detected; in addition, these factors were expected to contribute to female sexual function and sexual satisfaction. Another possible factor of influence, derived from the sexual self-schema, was also measured as a moderator or mediator for the outcomes of sexual function and sexual satisfaction. The framework is presented in Figure 1.1 and Figure 1.2 in Chapter 1.

Methodology

This is a mail survey study. The study information was sent to the potential participants or posted on websites or in newsletters through online groups, communities, and organizations. The potential participants who felt interested in participating in this study contacted the researcher by e-mail or phone. The study packages, including cover letter, two informed consent forms, seven questionnaires, incentives, a prepaid postcard, and a postage-paid envelope, were sent to the participants' residences. Sixty-one women with gynecological or rectal cancer were recruited, and 55 (90%) of them returned the questionnaires with the consent forms. Ninety-one women without any cancer were also recruited, and 72 (79%) of them completed their questionnaires and returned the informed consent forms.

Data Analysis

The quantitative data that were collected pertained to the personal information survey, DSFI Body Image Scale for Women, Hospital Anxiety and Depression Scale (HADS), Sexual Relationship Power Scale (SRPS), Sexual Self-Schema Scale (SSS)—Women Form, Female Sexual Function Index (FSFI), and Index of Sexual Satisfaction (ISS). Twenty-six women with gynecological/rectal cancer provided comments and information about their experiences in the margins of the questionnaires or letters, in e-mails, or in notes. Further, SPSS 16.0 was utilized to conduct data analyses, and the data analysis technologies were guided by research questions. Table 5.1 summarizes each research question and the corresponding method of analysis in this study.

Table 5.1 Research Questions and Methods of Analysis

Number	Questions	Methods of Analysis
1	Are there relationships among demographic characteristics, health histories, and disease characteristics with respect to (a) body image, (b) anxiety and depression, (c) sexual relationship power, (d) female sexual function, and (e) sexual satisfaction?	Pearson correlation
2	What is the relationship among body image, psychological status (anxiety and depression), sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction?	Pearson correlation
3	Does female sexual self-schema moderate (or mediate) the effects of body image, psychological status (anxiety and depression), and sexual relationship power on female sexual function and sexual satisfaction?	Hierarchical multiple linear regression, path analysis, and Sobel test
4	What are the differences in female sexual function and sexual satisfaction between females with rectal/gynecological cancer and females without any cancer?	MANCOVA
Additional analysis	What are the categories and themes identified in the unsolicited comments and experiences from women with gynecological/rectal cancer?	Qualitative content analysis

Findings

Sample characteristics. Fifty-five women with gynecological or rectal cancer—the study group—and 72 women without any cancer—the comparison group—were included in this study. The average ages of women in the study and comparison groups were 53 and 38, respectively. Ninety-five percent of women had experienced postmenopause or surgical menopause in the study group, compared to 21% in the comparison group. Eleven women in the study group used hormone replacement therapy, compared with four women in the comparison group.

In the study group, 47 women had gynecological cancer and 8 women had rectal cancer. The mean time since surgery ranged from .33 to 15 years. Forty-nine percent of the women with gynecological or rectal cancer were diagnosed at stage three, and 93% of the women experienced surgery after the diagnosis of gynecological or rectal cancer; 86% had postchemotherapy, and 24% had postradiotherapy.

Research Question 1. In relation to Research Question 1, the findings in the study group showed a significant negative relationship between time since surgery and total anxiety and depression ($r = –.37$) and between performance status and total anxiety and depression ($r = –.40$). They also revealed in the study group a significant positive relationship between performance status and sexual relationship power ($r = .31$). In the comparison group, there were significant negative relationships between age and sexual relationship power ($r = –.39$), the partner's age and sexual relationship power ($r = –.44$), the length of time with the partner and sexual relationship power ($r = –.40$), age and female sexual function ($r = –.27$), the length of time with the partner and female sexual

function (r = –.28), and the number of medical diseases and female sexual function (r = –.28). Significant positive relationships were found between age and sexual satisfaction (r = .25), and the length of time with the partner and sexual satisfaction (r = .26), but these significant negative and positive relationships in the comparison group were not supported by the data in the study group.

Research Question 2. Research Question 2 explored the relationships among the major variables, including body image, total anxiety and depression, sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction in both the study and comparison groups. Body image was significantly related to total anxiety and depression, sexual self-schema, and sexual satisfaction in both groups; however, a significant negative relationship was found between body image and sexual relationship power in the study group (r = –.31) but was not supported by the results in the comparison group (r = –.19).

Total anxiety and depression was significantly correlated with sexual relationship power and sexual satisfaction in both the study and the comparison groups. A negative relationship between total anxiety and depression and female sexual function was demonstrated in the study group (r = –.36) but not found in the comparison group (r = –.18); further, there was a significant negative relationship between total anxiety and depression and sexual self-schema in the comparison group (r = –.27) but not in the study group (r = –.14).

Sexual satisfaction was significantly related to sexual relationship power and female sexual function in both the study and the comparison groups. In addition, a

significant negative relationship between sexual satisfaction and sexual self-schema was found in the study group ($r = –.31$), but this relationship was not demonstrated in the data of the comparison group ($r = –.16$). Female sexual function was significantly correlated with sexual self-schema in the study and comparison groups.

Research Question 3. Research Question 3 tested the sexual self-schema as a predictor, mediator, or moderator on female sexual function and sexual satisfaction. The HMLR results showed that sexual self-schema was a significant predictor on the outcome of female sexual function, but sexual self-schema was not a significant predictor on the outcome of sexual satisfaction; also, the interaction terms between body image and sexual self-schema and between total anxiety and depression and sexual self-schema were not significant on female sexual function and sexual satisfaction as the outcomes, respectively.

With the outcome of female sexual function, the interaction between sexual relationship power and sexual self-schema was significant ($\beta = .27$, $p < .01$), with the model accounting for 45% of the variance. The interaction suggests that for women with more positive sexual self-schema, high sexual relationship power and better female sexual function scores were correlated, as were high sexual relationship power and better sexual function.

The model for sexual satisfaction as an outcome accounted for 44% of the variance, and the interaction between sexual relationship power and sexual self-schema was significant ($\beta = –.26$, $p < .01$). The findings demonstrated that women's positive sexual self-schema buffered them from worse sexual satisfaction when sexual

relationship power was high. In contrast, the combination of a more positive sexual self-schema and high sexual relationship power was related to better sexual satisfaction. When testing sexual self-schema as a mediator on the outcome of female sexual function and sexual satisfaction, the results of the Sobel test showed that sexual self-schema was not a significant mediator through the independent variables, including body image, anxiety and depression, and sexual relationship power, to the dependent variables, including female sexual function and sexual satisfaction.

Research Question 4. Research Question 4 examined the differences in female sexual function and sexual satisfaction between the study and the comparison groups. Comparing the two groups, the women with gynecological or rectal cancer reported significantly worse total female sexual function, sexual desire, sexual lubrication, sexual orgasm, sexual satisfaction, sexual pain, and total sexual satisfaction than those without any cancer. However, women in the study group were less sexually embarrassed or conservative than those in the comparison group.

Further, there was a significant negative relationship between female sexual function and sexual satisfaction, and the participant's age differed from women in the study group and the comparison group. Therefore, a two-group multivariate analysis of covariance was used to test the difference in female sexual function and sexual satisfaction between the study and the comparison groups. After controlling the participant's age, the factor of having gynecological or rectal cancer significantly influenced female sexual function and sexual satisfaction, indicating that women with

gynecological or rectal cancer had lower levels of female sexual function and sexual satisfaction compared with women without any cancer.

Additional analysis. Two separate hierarchical multiple linear regressions were conducted to examine the outcome measures of female sexual function and sexual satisfaction with the direct variables and a moderator of sexual self-schema according to the results of Research Question 3. With overall female sexual function as the outcome, the interaction between sexual self-schema and sexual relationship power was significant ($\beta = .27$, $p < .01$) after controlling for the factors of gynecological/rectal cancer, body image, sexual relationship power, and sexual self-schema. This positive interaction between sexual self-schema and sexual relationship power suggests that women with a positive sexual self-schema buffered women from low female sexual function when sexual relationship power was low. Further, this model explained 40% of the variance in female sexual function in the present study.

The model for overall sexual satisfaction without the predictor of female sexual function accounted for 41% of the variance, and the interaction between sexual self-schema and sexual relationship power was significant ($\beta = –.25$, $p < .01$). The interaction term explained that the combination of a negative sexual self-schema and low sexual relationship power was associated with low sexual satisfaction. When including female sexual function as a predictor in the model for overall sexual satisfaction, the model accounted for 58% of the variance, and sexual relationship power and sexual function were significant predictors, although the interaction term of sexual self-schema and sexual relationship power was not significant ($\beta = –.13$, $p > .05$).

During the data collection process, 26 women provided unsolicited personal comments and information about their experiences with the diseases. Qualitative content analysis was conducted on these data, and two general themes were identified: changes of sexual life and a thirst for sexual information. Women with gynecological or rectal cancer had experienced alterations to their bodies and worse sexual pain, and they wanted to maintain their intimate relationships after surgery and treatments. In addition, they also expressed that health care providers did not inform them about the changes of sexual function after surgery and treatments or automatically provide related sexual information and treatments; however, they felt that they badly needed to get some or more information about sex to determine whether they could recover to their pretreatment states.

Discussion of Findings

Body Image

The mean body image score as measured by the DSFI Body Image Scale was 24.31 for the study group and 20.03 for the comparison group, indicating that women with gynecological or rectal cancer had worse body image than those without any cancer. However, this difference in body image between the study and comparison groups did not achieve statistical significance after controlling the participant's age ($p = .06$). Scores on overall body image in other gynecological or rectal cancer populations using the DSFI Body Image Scale have not been reported in research studies; therefore, additional research studies may be required to understand this phenomenon further. However,

comparing to 59 women with sexual dysfunctions but without cancer (Derogatis & Melisaratos, 1979), the participants with gynecological/rectal cancer in this study had higher body image scores (indicating poorer body image) than women with sexual dysfunctions, whose mean score on the DSFI Body Image Scale was 20.11.

As discussed in Chapter 2, body image is affected by cancer surgery and related treatments (Burns et al., 2007; Engel et al., 2003; Gervaz et al., 2008; Hawighorst-Knapstein et al., 2004; Hendren et al., 2005; Krouse et al., 2009; Platell et al., 2004; Ross et al., 2007; Sideris et al., 2005), and the changes in body image can be temporary or permanent (Tierney, 2008). The women with gynecological or rectal cancer had poorer body image than those without any cancer in this study, although it did not achieve a statistical difference. Bakht and Najafi (2010) found a significant difference in body image between women with breast cancer and healthy women. In addition, Bukovic and colleagues (2008) also expressed that the body images of women with ovarian cancer were significantly different after cancer treatments.

Reliability and validity for the DSFI Body Image Scale have been established in general populations, female students, and a gynecological disease group (Andersen & Legrand, 1991; Derogatis & Melisaratos, 1979; Trapnell, Meston, & Gorzalka, 1997). To determine internal consistency regarding having gynecological or rectal cancer, all the participants in the present study were divided into two groups: the study group and the comparison group. Appropriate scores for internal consistency of total DSFI Body Image Scale were obtained for women having gynecological/rectal cancer in the study group (α = .82) and for women without any cancer in the comparison group (α = .74).

However, the reliability for the subscale of general body attributes was .54 in the comparison group, which was quite a bit lower than .7 (Table 4.6); even the number of the items in this subscale was more than the subscale of genital attributes. This would be a limitation of this study; further explorations for the reliabilities of the DSFI Body Image Scale and its subscales are necessary.

Anxiety and Depression

The mean anxiety and depression sum score using HADS was 13.33 (SD = 6.66) in the study group, while the mean anxiety score was 8.83 (SD = 4.24) and the mean depression score was 4.50 (SD = 3.55). In comparison with scores reported in two prior studies (Patel, Sharpe, Thewes, Bell, & Clarke, 2011; Suzuki et al., 2011), scores on overall anxiety and depression in the women with gynecological or rectal cancer in this study were higher than those of Japanese women with gynecological cancer, whose mean HADS score was 11.79, and higher than those of Australian patients with colorectal cancer and a mood or anxiety disorder, whose mean score was 8.27. Furthermore, both scores on the anxiety and depression subscales in the women with gynecological or rectal cancer were higher than those of women without any cancer in this study, a result that is consistent with the study conducted by Hinz et al. (2010), which found that anxiety and depression subscale scores were higher in the sample of patients with cancer than in the general population. However, only the scores of anxiety between women with gynecological/rectal cancer and those without cancer in this study achieved a statistical significance. The possible reason might be the small sample size in the study group of

this current study; in addition, there was a significant age difference between women in the study group and those in the comparison group in this study, even when the researcher controlled age as a covariate. Therefore, future studies with big and matched samples are needed to further explore the differences of anxiety and depression between women with gynecological/rectal cancer and women without any cancer.

In this study, women with gynecological or rectal cancer were more likely to have scores consistent with a diagnosis of a probable depressive or anxiety disorder. Of a total sample in this study, 30% of women with gynecological/rectal cancer and 19% of women without any cancer had probable anxiety disorders. Probable depressive disorders were found in 11% of women with gynecological/rectal cancer and 4% of women without any cancer. Further, these results are consistent with the study conducted by Bisseling, Kondalsamy-Chennakesavan, Bekkers, Janda, and Obermair (2009), which showed that a diagnosis of anxiety was made in 27% of the women with invasive stage one ovarian cancer and that 5% had a depressive diagnosis. It should be noted that 49% of the women with gynecological/rectal cancer in this study had a diagnosis of stage three cancer, while 100% of the women in Bisseling et al.'s study had a diagnosis of stage one cancer. The differences in cancer stage and types of gynecological cancer should be considered, as they might be related to the face that the women had different levels of anxiety and depression.

Regarding the HADS, the reliability and validity have been examined in various populations, including cancer, psychiatric, medical, HIV-infected, and normal populations (Bedford, Pauw, & Grant, 1997; Dagnan, Chadwick, & Trower, 2000;

Moorey et al., 1991; Savard, Laberge, Gauthier, Ivers, & Bergeron, 1998). High scores for internal consistency were maintained with women who have gynecological/rectal cancer and with women who do not have cancer in the present study; therefore, this study extends the ability of this instrument to measure anxiety and depression in women with gynecological/rectal cancer and women without any cancer with adequate reliability and validity.

Sexual Relationship Power

In this study, two types of sexual relationship power were measured by using the modified SRPS (SRPS-M): relationship control and decision-making dominance. The women with gynecological/rectal cancer had a mean sexual relationship power sum score, relationship control score, and decision-making dominance score that were significantly higher than those of women without any cancer in this study after controlling the difference of age between the study and the comparison groups. The scores of sexual relationship power in women with gynecological or rectal cancer using SRPS-M have not been reported in related studies; however, the mean for SRPS-M (mean = 2.88, SD = .40) in women with gynecological or rectal cancer was similar to that of African-American women in general (mean = 2.94, SD = .35; Jackson, 2005).

Regarding the SRPS-M instrument, Pulerwitz et al. (2000) and Jackson (2005) demonstrated its good reliability and validity in general women and African-American women. High scores of the total SRPS for the Cronbach's alpha of internal consistency were obtained in both the study and the comparison group in the present study, although

the SRPS-M had not previously been used in women with gynecological or rectal cancer. However, the reliabilities of the subscale of decision-making dominance in the study and comparison groups were lower than .7, which might be due to the number of the items in the subscale, which was lower than that of the subscale of relationship control (Table 4.11). Therefore, future studies that explore reliabilities of the SRPS-M and its subscales are needed.

Sexual Self-Schema

The mean sexual self-schema (SSS) sum score was 62.66 (SD = 14.89) for women with gynecological or rectal cancer, which is higher than the scores of other samples, including women without any cancer in this study (mean = 56.58, SD = 14.41), gynecological cancer survivors (mean = 59.1, SD = 15.6; Carpenter, Andersen, Fowler, & Maxwell, 2009), and Taiwanese females with rectal cancer (mean = 54.34, SD = 12.86; Au, 2009). This finding indicates that the women with gynecological or rectal cancer in this study had a more positive sexual self-schema than other populations reported on in the literature. However, after controlling the age difference between women with gynecological/rectal cancer and those without cancer in this study, women with gynecological/rectal cancer had significantly lower levels of the embarrassed-conservative feeling compared to women without any cancer. As discussed in Chapter 2, women who have a positive sexual self-schema tend to deal with sexual changes resiliently and be willing to discuss their sexual difficulties and sexual needs with their partners (Andersen, 1999; Carpenter et al., 2009). It should be noted that the sample in

this study was not randomly selected and that most women (85%) in this study group who had sexual dysfunction were willing to share their personal experiences with the researcher; therefore, it could be that women in this study group tended to have a less embarrassed-conservative attitude than women without any cancer.

Reliability and validity for the SSS scale have been established in female undergraduates (Andersen & Cryanowski, 1994), gynecological cancer survivors (Carpenter, Andersen, Fowler, & Maxwell, 2009), and Taiwanese people with rectal cancer (Au, 2009). The scores for internal consistency of the SSS scale in this study were .75 for women with gynecological/rectal cancer, which was the same as the study of Andersen, Woods, and Copeland (1997) in gynecological cancer survivors, and .63 for women without any cancer, which was lower than those in the study of Wiederman and Hurst (1997) in young adult women (α = .72). Although the Cronbach's alpha in women without any cancer is below .7 in the present study, the reliability of the SSS scale was confirmed by previous studies. However, additional studies are needed to explore the stability of reliabilities of the sexual self-schema scale.

Research Question 1

Research Question 1 investigated the relationships among demographic characteristics, health histories, and disease characteristics with respect to body image, anxiety and depression, sexual relationship power, female sexual function, and sexual satisfaction.

In this study, demographic characteristics—including age, partner's age, length of time with the partner, number of children, and number of medical diseases—did not have relationships with body image, anxiety and depression, sexual relationship power, sexual function, and sexual satisfaction for women with gynecological/rectal cancer.

Female sexual dysfunction is an age-related issue (Raina et al., 2007; Vardi, 2006), and other research studies have demonstrated that age is an important factor related to female sexual function after gynecological and rectal cancer (Carmack Taylor et al., 2004; Hendren et al., 2005; Keating, 2004; Schmidt et al., 2005a; Thranov & Klee, 1994). However, there were significant relationships between age and female sexual function ($r = –.27$) and between age and satisfaction ($r = .25$) among women without any cancer (the comparison group) in this study, indicating that younger women had better sexual function and sexual satisfaction than older women. As discussed in Chapter 2, young women tended to be more sexually active and stressed about sexual dysfunction than older women (Carmack Taylor et al., 2004; Lange et al., 2009; Hendren et al., 2005; Thranov & Klee, 1994; Tekkis et al., 2009). It should be noticed that the age difference between those in the study group (mean = 52.73, SD = 9.73) and those in the comparison group (mean = 37.78, SD = 11.94) in the present study (t (124.44) = –7.77, $p < .001$) indicates that women in the study group were significantly older than women in the comparison group. In addition, 42% of women in the study group hadn't attempted to have sexual intercourse for at least the previous month, compared to 19% of women in the comparison group.

A partner's sexual function influences female sexual function (Carmack Taylor et al., 2004; Kingsberg, 2002). The present study explored the effects of the partner's age and the length of time with the partner on female sexual function and sexual satisfaction. The findings showed that there was not a significant relationship between the partner's age and female sexual function or between the partner's age and sexual satisfaction in either the study or the comparison group. It should be noted that the partners' ages differed between the study group (mean = 55.10, SD = 10.84) and the comparison group (mean = 39.40, SD = 11.80), t (117) = –7.45, $p < .001$. As discussed in Chapter 2, males might experience midlife changes such as hormonal, blood flow, libido, sensitivity, and ejaculation changes in their sexual function after their forties, especially males who had sexual dysfunction before their forties (Kingsberg, 2002). In this study, the mean age of current partners for women without any cancer was close to 40 years, while the partners' mean age for women with gynecological/rectal cancer was over 50 years. The findings demonstrate that the age of the partner was not significantly associated with female sexual function or sexual satisfaction in women with gynecological/rectal cancer and those without any cancer.

The length of time the participants had been with their partners was not significantly related to female sexual function and sexual satisfaction for women with gynecological or rectal cancer in the present study, but it did play a significant role in female sexual function and sexual satisfaction for women without any cancer and indicated that women who had been with their current partners for a short time reported better sexual function and sexual satisfaction than women who had been with their

current partners for a long time. As discussed in Chapter 2, Fasching et al. (2007) expressed that having a new partnership positively accommodated the changes that come with cancer surgery and treatment. The average length of time with the partner in women with gynecological or rectal cancer (mean = 21.53, SD = 11.90) was significantly longer than the average time in women without any cancer (mean = 11.65, SD = 10.79) in the current study, t (118) = –4.76, $p < .001$. This might be an explanation for the differences in findings between the study and comparison groups regarding the effects of the length of time with the partner on female sexual function and sexual satisfaction.

Not only cancer but also chronic diseases, including diabetes, hypertension, and hyperlipidemia, might lead to sexual dysfunction in females (Goldstein & Berman, 1998; Morley & Tariq, 2003; Park et al., 1997; Raina et al., 2007). The present study found a relationship between the number of medical diseases and female sexual function in both the study and the comparison groups, indicating that women who had more medical diseases reported lower sexual function than women who had fewer medical diseases. However, this relationship did not reach statistical significance for women with gynecological/rectal cancer, perhaps due to the small sample size or to the fact that the study group was smaller than the comparison group.

As for the disease characteristics of women with gynecological or rectal cancer, time since surgery, cancer stage, and performance status did not have significant relationships with female sexual function and sexual satisfaction. However, time since surgery was significantly related to anxiety and depression (r = –.37, $p < .01$), and

performance status had a relationship with anxiety and depression ($r = –.40$, $p < .01$) and sexual relationship power ($r = .31$, $p < .05$).

Time since surgery was negatively related to anxiety and depression in women with gynecological or rectal cancer, a finding that is consistent with a previous study (Bisseling, Kondalsamy-Chennakesavan, Bekkers, Janda, & Obermair, 2009) that showed that women whose surgery had occurred a long time before had low anxiety and depression. Time since surgery did not have a significant relationship with female sexual function and sexual satisfaction, however, which was different than the prior-study findings discussed in Chapter 2. However, Greenwald and McCorkle (2008) had the same finding as in this study that time since cervical cancer diagnosis did not influence female sexuality and sexual function.

There was not a statistically significant relationship between cancer stage and female sexual function ($r = –.07$) and between cancer stage and sexual satisfaction ($r = .03$). The results differ from those discussed in Chapter 2, which showed that women with stage one cervical cancer experienced a lesser effect on sexuality and sexual function than did women with cancer in more advanced stages (Greenwald & McCorkle, 2008). However, it should be noted that only 21% of women in the present study were diagnosed as having stage one cancer, compared to 63.8% in Greenwald and McCorkle's study.

The number of cancer treatments was significantly related to female sexual function ($r = –.27$, $p < .05$) and sexual satisfaction ($r = .29$, $p < .05$), indicating that women with gynecological or rectal cancer who received more cancer treatments

reported lower sexual function and satisfaction than women who received fewer treatments. As discussed in Chapter 2, Madoff (2004) found that chemotherapy and radiotherapy have negative effects on sexual function. Further, the results were supported by the previous study of Greimel, Winter, Kapp, and Haas (2009), in which women with cervical cancer who experienced surgery and radiotherapy had a lower sexual function compared to women who experienced surgery alone.

According to the Eastern Cooperative Oncology Group–Performance Status scale (ECOG-PS), 66% of women with gynecological or rectal cancer could perform activities without any restrictions. These women also had high performance status and reported low anxiety and depression (r = –.40) and high sexual relationship power (r = .31) compared to those with low performance status. In addition, the results also showed that performance status did not have a significant relationship with female sexual function (r = .16) or sexual satisfaction (r = –.10). However, the results lack previously reported data for comparison.

Research Question 2

Research Question 2 was used to test the relationships among body image, psychological status (anxiety and depression), sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction.

With regard to the relationship between female sexual function and sexual satisfaction, women with better sexual function had significantly high sexual satisfaction in both the study and the comparison group. This finding in the present study is in line

with findings from studies by Dundon and Rellini (2010) and Pujols et al. (2010). Further, Yeh, Lorenz, and Wickrama (2006) expressed that good sexual satisfaction can predict marital stability.

Positive sexual self-schema was significantly related to good sexual function and high sexual satisfaction for women with gynecological or rectal cancer in the present study, and this result was supported by the studies of Carpenter et al. (2009) and Donovan et al. (2007), which showed that women with a negative schema tended to have lower sexual function and sexual satisfaction than women with a positive schema. Women with a negative sexual self-schema have a conservative and negative attitude toward sexual behaviors, and this attitude decreases sexual desire and arousal, increases sexual anxiety, leads them to avoid sexual activities, and inhibits intimate relationships (Andersen & Does, 1994; Carpenter et al., 2009). All of this causes the women to internalize sexual dysfunction and exacerbates sexual problems (Cyranowski et al., 1999; Carpenter et al., 2009).

Women with positive schemas deal with stress resiliently when facing changes in their sexuality (Carpenter et al., 2009), and body image is an important part of women's sexual self-concept (Cohen, Kahn, & Steeves, 1998; Junkin & Beitz, 2005; White, 2000). In the present study, a positive sexual self-schema was associated with a good body image for women with gynecological or rectal cancer and for those without cancer, which was consistent with Donaghue's (2009) finding that women's sexual self-schema was significantly related to body satisfaction. Other researchers reported no significant direct link between body image and sexual self-schema in young women aged from 18 to 29

(Reissing, Laliberte, & Davis, 2005). It is important to note that their sexual self-schemas would likely change after they had more sexual experiences (Cyranowski, Aarestad, & Andersen, 1999).

Regarding sexual relationship power, women in this study expressed higher sexual satisfaction when they had high relationship power, no matter whether they were in the study or the comparison group. Only a few previous studies have used SRPS-M to explore a correlation between relationship power and sexual satisfaction, especially for women with gynecological or rectal cancer. As discussed in Chapter 2, power equality has a positive influence on communication in sexual relationships (Blanc, 2001), and Whisman and Jacobson (1990) found a negative relationship between power inequality and marital satisfaction. Furthermore, relationship power is correlated with sexual dysfunction (Lau et al., 2006). In this study, relationship power was positively related to female sexual function in both the study and comparison group; however, this relationship did not reach a statistical significance ($p < .05$).

A statistically significant negative relationship was found between anxiety and depression and sexual relationship power for women with gynecological or rectal cancer and those without any cancer in the present study, although few studies using HADS and SRPS-M had explored this relationship previously. Halloran (1998) explained a bidirectional relationship between depression and power inequality, saying that women with depression would increase the power disproportionality in their relationships and that good communication helped decrease levels of depression (Ferroni & Taffe, 1997). A more positive body image was associated with increased sexual relationship power for

women with gynecological or rectal cancer in this study, but this relationship was not statistically significant in the comparison group. No data from previous studies were found to support this finding or to compare the relationships between relationship power and body image, especially for women with gynecological or rectal cancer; therefore, future studies would be needed to fill this gap.

Bodurka and Sun (2006) and Carmack Taylor et al. (2004) demonstrated a negative relationship between anxiety and depression and sexual function, which was similar to the results of the present study showing that high anxiety and depression were associated with poor sexual function for women with gynecological or rectal cancer and those without any cancer. Further, the present study also found that high anxiety and depression had a significant relationship with low sexual satisfaction. However, Corney et al. (1993) found that women with gynecological cancer who had a sexual disorder suffered moderate or severe distress. Therefore, future studies would be needed to explore the direction of the relationships between anxiety and depression and female sexual function and between anxiety and depression and sexual satisfaction.

Body image plays an important part in sexuality (Wiederman, 2002), and females are more focused on their body image compared with males (Davison & McCabe, 2005). In the present study, good body image was significantly associated with low anxiety and depression in both the study and the comparison group, and the results were similar to those of da Silva et al. (2008), Benrud-Larson et al. (2003), and Johnson and Wardle (2005). In previous studies, a significant relationship was found between the changes in body image and female sexual dysfunction (Bodurka & Sun, 2006; Carmack Taylor et al.,

2004; da Silva et al., 2008; Fobair et al., 2006; Fucini et al., 2008; Kilic et al., 2007), and this relationship was demonstrated in the present study: good body image was significantly related to good female sexual function for women with no cancer ($r = –.34$, $p < .01$). However, this relationship did not reach statistical significance for women with gynecological or rectal cancer ($r = –.27$, $p > .05$), perhaps because the sample size of the study group was smaller than the comparison group.

Further, high levels of body image positively influenced levels of sexual satisfaction for women in the present study, not only for those with gynecological or rectal cancer but also for those without any cancer. In 2010, Pujols, Meston, and Seal explained the positive relationships among body image, female sexual function, and sexual satisfaction, which were similar to what was found in this study.

Research Question 3

Research Question 3 tested female sexual self-schema to determine whether it mediates or moderates the effects of body image, anxiety and depression, and sexual relationship power on female sexual function and sexual satisfaction. Sexual self-schema was a significant moderator between sexual relationship power and female sexual function and between sexual relationship power and sexual satisfaction in the present study. To investigate the interaction between sexual relationship power and sexual self-schema, simple slopes analyses were conducted by dividing the participants into three groups around the mean (mean of SSS = 59.60) with one standard deviation (SD of SSS = 15.29) of sexual self-schema, which was < 44.31, 44.31 ~ 74.89, and > 74.89.

The final model for female sexual function showed that gynecological/rectal cancer (yes/no) (β = –.29, p < .01) and the interaction between sexual relationship power and sexual self-schema (β = .27, p < .01) had significant effects. Gynecological or rectal cancer had a significant negative effect on female sexual function. This result is in line with the findings of studies by Hendren et al. (2005), Carmack Taylor et al. (2004), and Andersen, Lachenbruch, Anderson, and Deprosse (1986). Few studies in the literature have shown sexual self-schema to be a moderator between sexual relationship power and female sexual function. As shown in Figure 5.1, high sexual relationship power was related to good sexual function only among women with a positive sexual self-schema. However, the relationship among sexual relationship power, sexual self-schema, and sexual function has rarely been explored in previous studies; those that did research it showed that the combination of high sexual relationship power and positive sexual self-schema are associated with heightened levels of female sexual function.

The final model for sexual satisfaction indicated that gynecological/rectal cancer (yes/no) (β = .39, p < .001), sexual relationship power (β = –.33, p < .001), and the interaction between sexual relationship power and sexual self-schema (β = –.26, p < .01) had significant effects. Gynecological/rectal cancer and low sexual relationship power were significantly related to low sexual satisfaction. Further, high sexual relationship power had a significant relationship with good sexual satisfaction among women with a positive or an average sexual self-schema, but especially for women with a positive sexual self-schema (Figure 5.2). A negative relationship between power inequality and marital satisfaction was demonstrated by Whisman and Jacobson (1990), and women

with a positive schema tended to have a more positive attitude toward sexuality than women with a negative schema (Andersen & Does, 1994; Carpenter et al., 2009). Thus, this study found that women with a positive sexual self-schema who also had high sexual relationship power were more likely to have high sexual satisfaction.

Figure 5.1 Simple Slopes Analysis of the Relationship Between Sexual Relationship Power and Female Sexual Function with a Positive, Average, and Negative Sexual Self-Schema

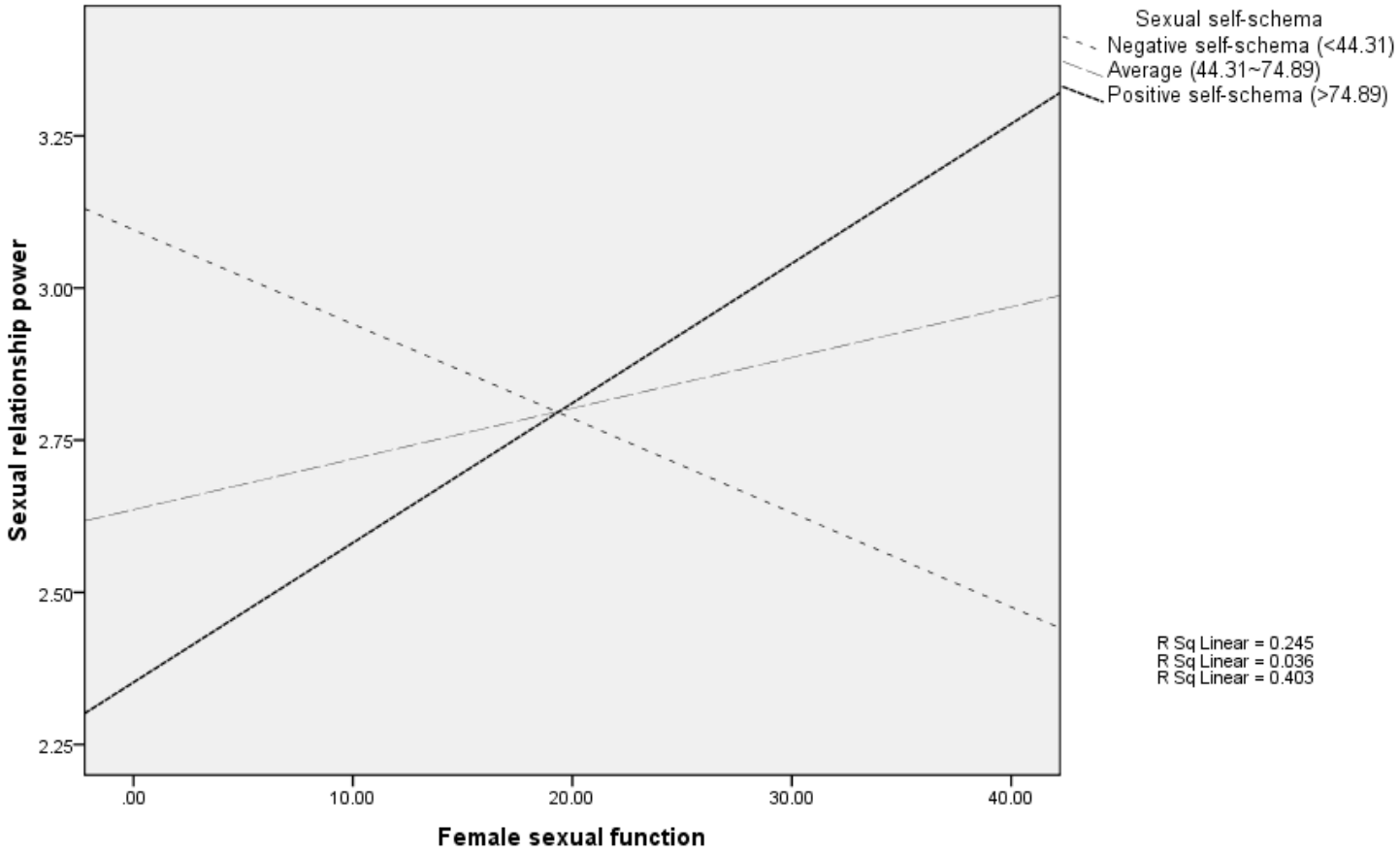
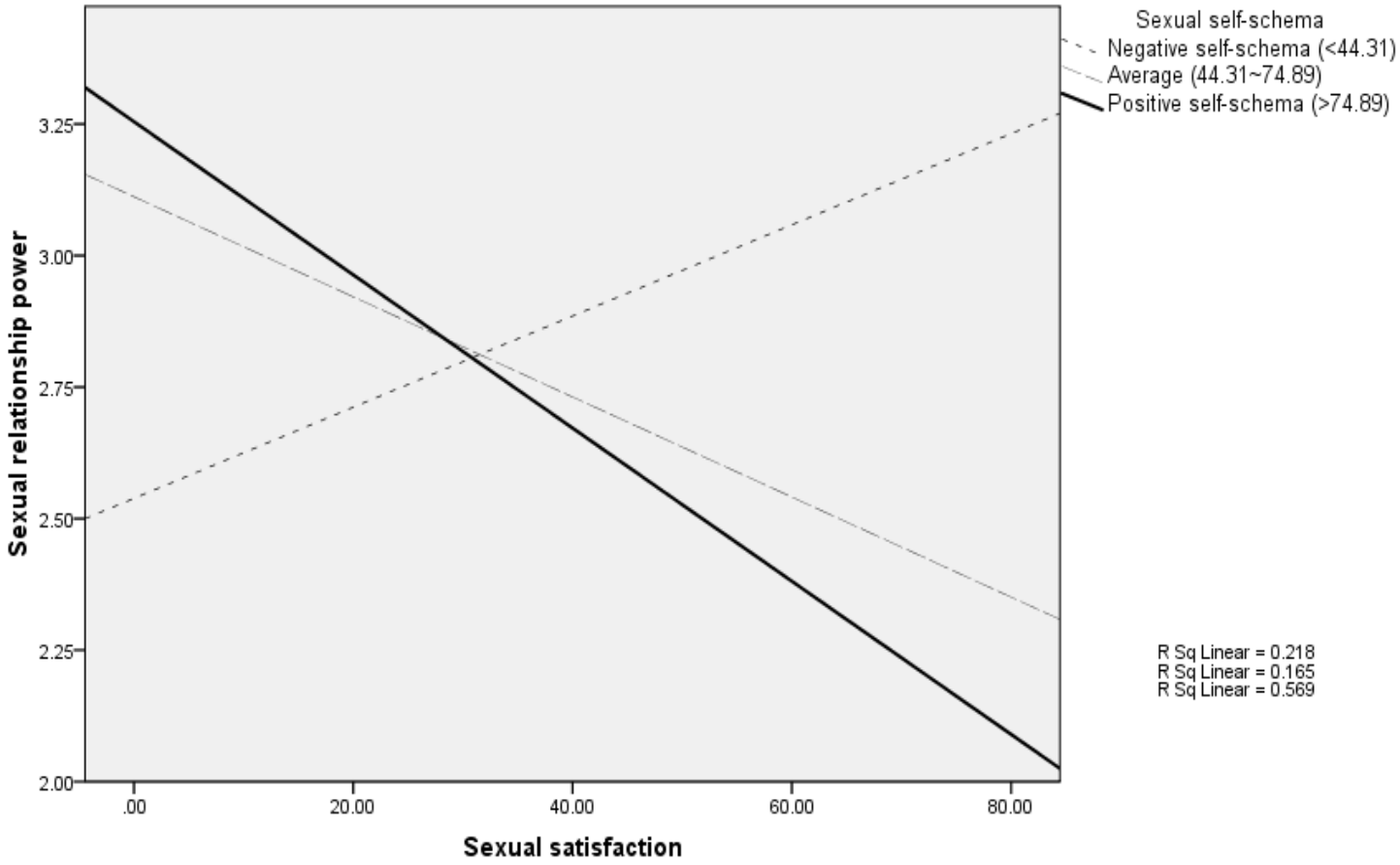


Figure 5.2 Simple Slopes Analysis of the Relationship Between Sexual Relationship Power and Sexual Satisfaction with a Positive, Average, and Negative Sexual Self-Schema



Research Question 4

Research Question 4 explored the differences in female sexual function and sexual satisfaction between women with gynecological/rectal cancer and those without any cancer.

The mean female sexual function sum score as measured by the FSFI was 16.12 in the study group, which was below the comparison group's mean score of 24.91, indicating that women with gynecological or rectal cancer had worse sexual function than women without any cancer. However, after controlling the age difference between the study and comparison groups, women with gynecological or rectal cancer had significantly lower levels of total female sexual function and sexual desire, worse lubrication, lower frequency of sexual orgasm, lower sexual satisfaction, and more severe sexual pain compared with women without any cancer. The results of this study supported the finding of Aerts, Enzlin, Verhaeghe, Vergote, and Amant (2009), who found that women with a history of gynecological cancer had significantly more sexual dysfunction, more decreased sexual desire, and poorer vaginal lubrication than controls. Female sexuality is directly affected by gynecological cancer and its treatments (Wilmoth & Spinelli, 2000). It should be noted that 93% of women in this study who had gynecological or rectal cancer underwent surgery, 86% received postchemotherapy treatment, and 24% received postradiotherapy treatment. Likewise, Bruheim et al. (2010) found that women who received radiotherapy after rectal cancer had significantly more vaginal problems, including lack of lubrication, dyspareunia, and reduced vaginal dimension, than women not receiving radiotherapy. Further, women with rectal cancer

who underwent pelvic surgery reported significantly more sexual dysfunction, including a short or less elastic vagina and severe sexual pain, compared with controls (Platell, Thompson, & Makin, 2004). In a previous study by Cleary, Hegarty, and McCarthy (2011), female sexual function was significantly influenced by gynecological cancer and its treatments: 73% of women reported a decrease in the frequency of intercourse, 60% had difficulties in sexual arousal, 64% had problems with lubrication, and 35% had problems reaching orgasm.

Further, female sexual function in women with gynecological or rectal cancer in this study showed more sexual dysfunction than other samples, including women with vulvar intraepithelial neoplasia (mean = 17.55; Likes, Stegbauer, Hathaway, Brown, & Tillmanns, 2006), women with breast cancer (mean = 20.19; Alder et al., 2008), women with rectal cancer (mean = 17.5; Hendren et al., 2005), and women with cervical cancer (mean = 17.20; Serati et al., 2009). In the study conducted by Peterson, Rothenberg, Bilbrey, and Heiman (2010), women without cancer who had had a hysterectomy (mean = 16.70) had sexual function similar to that of women with gynecological or rectal cancer in the present study. However, in the sample of endometrial cancer survivors who had adjuvant vaginal brachytherapy (Becker et al., 2011), female sexual function (mean = 7.8)—including desire (mean = 1.8), arousal (mean = 1.4), lubrication (mean = 1.1), orgasm (mean = 1.5), satisfaction (mean = 1.3), and pain (mean = .6)—was worse than that of women with gynecological or rectal cancer in the current study.

Of the women with a history of gynecological or rectal cancer in this study, 85% had female sexual dysfunction, indicated by an FSFI sum score lower than 26.5, while

44% of the women without any history of cancer had such dysfunction. This result shows that the percentage of women with gynecological or rectal cancer who report an FSFI score below 26.5 (85%) is higher than the percentage of women with stage one and two breast cancer who score below 26.5 (67.9%) (Alder et al., 2008).

Reliability and validity for the FSFI have been established in women with sexual dysfunction (Meston, 2003; Rosen et al., 2000; Wiegel et al., 2005), women with gynecological cancer (Carpenter et al., 2009), women with no cancer who have had a hysterectomy (Peterson et al., 2010), women with breast cancer (Alder et al., 2008), and women with vulvar intraepithelial neoplasia (Likes et al., 2006). High scores for internal consistency were obtained with women with gynecological/rectal cancer (α = .98) and those without any cancer (α = .98) in the present study. This is an important finding in that it extends the ability of the FSFI instrument to measure female sexual function in women with cancer across other samples.

Toward sexual satisfaction in this current study, the mean sexual satisfaction as measured with ISS was 37.37 (SD = 21.13) in the study group, compared with 24.08 (SD = 14.28) in the comparison group, indicating that women with gynecological or rectal cancer had less sexual satisfaction than women without any cancer. Even after controlling the difference of age between women in the study group and comparison group, there was still a significant difference between women with gynecological/rectal cancer and those without any cancer in the levels of sexual satisfaction. However, sexual satisfaction scores using ISS in women after gynecological or rectal cancer treatments have not been reported in related studies; however, the mean score in women with

gynecological or rectal cancer was unlike those of males with prostate cancer (mean = 56.91; Garos, Kluck, & Aronoff, 2007) and patients with sexual problems (mean = 41.5; Hudson, Harrison, & Crosscup, 1981). Compared to ISS data from Franco et al. (2000) and Sauers (1993), women with gynecological or rectal cancer reported a higher level of sexual dissatisfaction than women with a high risk for ovarian cancer (mean = 23.0), menopausal women using hormone replacement therapy (HRT; mean = 22.0), and menopausal women who do not use HRT (mean = 22.6).

Using the clinical cutoff ISS score of 30 set by Hudson et al. (1981) to identify clinical sexual problems, 62% of women with gynecological or rectal cancer had scores greater than 30 in this study, compared to 33.3% of menopausal women using HRT and 32.6% of menopausal women not using HRT (Sauers, 1993).

Regarding the ISS, reliability and validity have been established in males with prostate cancer (Garos, Kluck, & Aronoff, 2007), menopausal women (Sauers, 1993), women at high risk of ovarian cancer (Franco et al., 2000), and people with sexual problems (Hudson, Harrison, & Crosscup, 1981). High scores for internal consistency were obtained for women with gynecological/rectal cancer (α = .95) and those without any cancer (α = .94) in this study; furthermore, using the FSFI scores with a cutoff point of 26.55, all the subjects in the present study were divided into two sexual function categories to determine the discriminant validity of the ISS. A significant difference in the overall ISS scores was found between the sexual dysfunction and nonsexual dysfunction groups. The present investigation extends the ability of the ISS instrument to

measure sexual satisfaction in women with gynecological or rectal cancer and women without any cancer with adequate reliability and validity.

In the present study, gynecological or rectal cancer affected not only female sexual function but also sexual satisfaction. Women with gynecological or rectal cancer reported worse sexual satisfaction than women without any cancer. Cleary et al. (2011) expressed that 56% of women with gynecological cancer felt that their sexual fulfillment had decreased; however, 75% of women felt that the closeness with their partners had not changed, and in some cases had even increased, since they received their cancer diagnoses. Therefore, the relationships between women with gynecological or rectal cancer and their partners should be explored further.

Additional Analysis

According to the results of Research Question 3 (Table 4.30), gynecological/rectal cancer, body image, and the interaction between sexual relationship power and sexual self-schema might be significantly linked with female sexual function. A hierarchical multiple regression for predicting the outcome of female sexual function with the predictors, including gynecological/rectal cancer (yes/no), body image, sexual relationship power, sexual self-schema, and the interaction term of sexual relationship power and sexual self-schema was conducted (Table 4.38). As expected, the final model of this regression showed that gynecological/rectal cancer, body image, and the interaction between sexual relationship power and sexual self-schema were significantly related to female sexual function. In previous studies, sexual self-schema ($\beta = .21$, $p <$

.01) was a significant predictor in the regression analysis of female sexual function in gynecological cancer survivors (Carpenter et al., 2009). Yurek et al. (2000) also found that sexual self-schema was a significant factor in exploring the variance of current sexual activity for women with breast cancer. These previous results were not supported by this current study, which found that sexual self-schema was not a statistically significant predictor ($\beta = .16$, $p > .05$) in the regression analysis for female sexual function. However, this study provided new information that sexual self-schema would enhance the positive relationship between sexual relationship power and female sexual function, and women's body image played an important role ($\beta = –.18$, $p < .05$) in female sexual function.

Moreover, an additional analysis of the hierarchical multiple regression was conducted to explore sexual satisfaction with female sexual function as a predictor (Table 4.39). Before including the factor of female sexual function in the fifth model for sexual satisfaction, the factors of gynecological/rectal cancer, body image, sexual relationship power, and the interaction term between sexual relationship power and sexual self-schema were significant. After adding the predictor of female sexual function in the final model, female sexual function could explain 17% of the variance in sexual satisfaction, and sexual relationship power accounted for 8% of the variance in sexual satisfaction in this study. However, sexual self-schema was not a significant predictor in this final model ($\beta = .02$, $p > .05$), which was not in line with the studies by Carpenter et al. (2009) and Donovan et al. (2007), which showed that sexual self-schema was an important predictor to explain sexual satisfaction. Donovan et al. (2007) explained that vaginal

changes could significantly predict sexual satisfaction ($\beta = -.54$, $p < .001$), which is consistent with the current study's finding that female sexual function was an important factor in the levels of sexual satisfaction.

With regard to the qualitative data in the unsolicited experiences and comments shared by women with gynecological or rectal cancer in this study, these women expressed that their sexual lives had changed after cancer and its treatments. They experienced changes of the body, and these changes included their physical structures and their psychological perceptions about their bodies. This result is consistent with the qualitative study by Rasmusson and Thome (2008), which demonstrated that women with gynecological cancer were concerned about the changes in their bodies. In addition, for the women in the present study's study group, the changes in their vaginal structures and early menopause had caused sexual intercourse to become intolerably painful, which is in line with other studies on women with rectal cancer (Böhm et al., 2008; Hendren et al., 2005; Tekkis et al., 2009) and with gynecological cancer (Thranov & Klee, 1994; Bukovic et al., 2008) showing that dyspareunia was the most common form of sexual dysfunction. Tang, Lai, and Chung (2010) demonstrated that spousal support was a significant predictor for sexual satisfaction, and Rasmusson and Thome (2008) conducted qualitative research and also found that support from the partner was important for women with gynecological cancer. However, gynecological cancer survivors indicated less self-masturbation, kissing and caressing, and engaging in sexual fantasy when compared with healthy women (Tang et al., 2010). Further, in the study by Sacerdoti, Lagana, and Koopman (2010), women expressed that gynecological cancer had a

negative impact on their intimate relationships. This current study supported the results of previous studies showing that intimate partners play an imperative role during the process of overcoming the disease. However, some women conveyed that the changes in sexual function led them to do other things with their partners in place of sexual intercourse.

In the present study, women shared that they hadn't been informed of the changes that would occur in their sexual function after the surgery and treatments. In addition, they conveyed that they wanted to have knowledge regarding these changes. Rasmusson and Thome (2008), who found that women wanted to have in-depth knowledge about the effects on their sexuality caused by gynecological cancer and its treatments, supported the finding of the current study. However, Kotronoulas, Papadopoulou, and Patiraki (2009) found that oncology nurses often failed to respond to cancer patients' expressions of sexual concerns due to their own limited sexual knowledge and ineffective communication skills. The results of the current study showing that women felt frustrated with their health care providers' attitudes about sexual issues and believed those providers were so concerned with curing the disease that they disregarded the issues that would follow were also supported by the prior study (Kotronoulas et al., 2009).

Limitations

There are several limitations in this present study. First of all, the recruitment strategy used in this research may have limited the kinds of potential participants because the study information was announced to online cancer support groups and online health organizations. Most participants got the study information through e-mails, online

newsletters, or websites that reflected self-selection bias. Therefore, the sample in this study was not randomly selected. Second, the sample size of this study was convenient and small; therefore, the results cannot be generalized beyond this population. Third, the research was limited by the cross-sectional design, which could not explore cause-and-effect inferences. Fourth, all measures were self-reports. Five, the study did not ask what types of gynecological cancer that the women had, and the women with rectal cancer were the minority in the study group. Six, the participants in both the study group and the comparison group were highly educated. Seven, the comparison group had more Asian women than the study group, and this might be because the researcher is Asian and the potential participants could identify her by her name, choosing to help her with her project. Finally, age and menopause status directly influence female sexual function, but the mean ages for women in the study group and those in the comparison group of this study were not matched. Furthermore, 95% of the women with gynecological or rectal cancer had entered postmenopause or experienced surgical menopause, compared to 21% of the women without any cancer. Therefore, the comparison of levels of female sexual function between women with gynecological or rectal cancer and women without any cancer might have some biases.

Conclusions

Seven major conclusions of this descriptive, correlational, and comparative study for women with gynecological or rectal cancer and controls are presented.

1. For women with gynecological or rectal cancer, long time since surgery was significantly related to low anxiety and depression, and good performance status was significantly linked with low anxiety and depression and high sexual relationship power. In addition, women with gynecological or rectal cancer who underwent more cancer treatments reported lower sexual function and sexual satisfaction than women who had fewer cancer treatments.
2. Good body image was significantly associated with low anxiety and depression, high sexual relationship power, positive sexual self-schema, and high sexual satisfaction for women with gynecological or rectal cancer. Further, significant relationships were found between high anxiety and depression and low sexual relationship power, between high anxiety and depression and low sexual function, and between high anxiety and depression and low sexual satisfaction for women with gynecological or rectal cancer. Women with gynecological or rectal cancer who had a positive sexual self-schema demonstrated good female sexual function. In addition, high sexual satisfaction had a relationship with high sexual relationship power, positive sexual self-schema, and good female sexual function in women with gynecological or rectal cancer.
3. Sexual self-schema as a moderator influenced the relationship between sexual relationship power and female sexual function and that between sexual relationship power and sexual satisfaction.
4. Women with gynecological or rectal cancer had higher anxiety; lower embarrassed-conservative attitude; worse female sexual function, desire,

lubrication, orgasm, satisfaction, and pain; and lower sexual satisfaction than women without any cancer.

5. Gynecological/rectal cancer, body image, and the interaction between sexual relationship power and sexual self-schema were significant predictors of female sexual function. Furthermore, high sexual relationship power and good female sexual function significantly predict high sexual satisfaction.
6. Women with gynecological or rectal cancer expressed that their sexual lives had changed after surgery and treatments due to the alteration of their bodies and increased sexual pain. However, women tried to maintain the intimate relationships with their partners because the partners played an important supportive role during the disease process.
7. Women with gynecological or rectal cancer indicated that they had not been informed about the changes that would occur related to sexuality; further information about sexual function after surgery and treatments was needed. However, health care providers did not provide enough information or related treatments for women who experienced gynecological or rectal cancer to help them understand and possibly improve their new sexuality.

Implications and Recommendations for Nursing

The findings of the study provided some implications and recommendations for the conceptual framework, nursing practice, education, and research.

Conceptual Framework

The conceptual framework was developed by the researcher based on literature, radical feminism, and the theory of gender and power to guide this study due to a lack of comprehensive theoretical models for female sexual function and sexual satisfaction. The data of the study supported some parts of the conceptual framework, and additional research studies are needed to explore other parts.

Regarding the relationships among the variables of body image, anxiety and depression, and sexual relationship power, significant relationships were found to exist between body image and anxiety and depression, between body image and sexual relationship power, and between anxiety and depression and sexual relationship power. Those relationships supported parts of the framework.

Gynecological or rectal cancer and body image as significant direct predictors and sexual self-schema as a significant moderator of the relationship between sexual relationship and female sexual function predicted female sexual function. However, demographic characteristics and anxiety and depression did not have significant effects on female sexual function; therefore, additional studies are needed to explore these relationships.

As for sexual satisfaction, the factors of gynecological or rectal cancer, body image, and sexual relationship power were significant predictors and sexual self-schema was a moderator of the relationship between sexual relationship power and sexual satisfaction. However, anxiety and depression was not a significant predictor for sexual satisfaction. Future studies are required to clarify these relationships. In addition, after controlling for gynecological or rectal cancer, body image, sexual relationship power, and sexual self-schema as a moderator of sexual relationship power and sexual satisfaction, female sexual function was shown to be the most significant predictor for the outcome of sexual satisfaction.

The study findings did not explore the causal relationships among disease characteristics, female sexual function, and sexual satisfaction because of the small sample of women in the study group. A future study with a large sample is suggested to explore the effects of disease characteristics on female sexual function and sexual satisfaction for women with gynecological or rectal cancer.

Nursing Practice

In the present study, gynecological or rectal cancer had a significant effect on female sexual function and sexual satisfaction. Some women expressed their beliefs that their health care providers had not informed them in a timely manner of the changes to expect in their sexual function after the surgery and treatments, and 54.7% of women in the study group claimed that they were very or moderately dissatisfied with their relationships with their partners. Therefore, the most important implication for nurses in

practice is not only to provide timely and appropriate sexual information and therapies after gynecological or rectal cancer surgery and treatments but also to inform women with gynecological or rectal cancer about the changes they may experience in sexuality.

The background of this research was radical feminism and the theory of gender and power; therefore, sexual relationship power was explored for female sexual function and sexual satisfaction, and the finding showed sexual relationship power to be a significant predictor for sexual satisfaction. The useful and brief evaluation tool for measuring relationship power should be available to health care providers, and nurses would need to have the ability to evaluate the relationship power status between women and their partners. As a result, health care providers can pay more attention to women with low relationship power based on the result of the evaluation tool because these women may be at a higher risk of having low sexual satisfaction.

Nursing Education

Sexuality plays an important role in women's health, and appropriate sexual assessment and information can increase the satisfaction of women and the outcomes related to their health. Nursing educators would be challenged to teach students to be sensitive to sexual needs and concerns of women with gynecological or rectal cancer. Female sexual function is complicated and multidimensional, influenced by physical, psychological, and social status. Students need to know the definition of female sexual function and understand what factors influence female sexuality, especially for women who undergo surgery and related treatments.

Women with gynecological or rectal cancer expected to be informed of the changes in their sexuality and receive timely sexual information after the diagnosis. Therefore, effective communication skills are important for discussing sensitive issues with women and their partners and for providing appropriate sexual knowledge. Nursing courses about female sexuality should include communication skills so that students can become practiced and be able to show sensitivity in assessing women's sexual concerns and needs.

Nursing Research

Several recommendations are made for future nursing studies to explore female sexual function and sexual satisfaction in women with gynecological or rectal cancer. First, significant relationships between the partner's age and female sexual function were not found in women with gynecological or rectal cancer or in women without any cancer. As discussed in Chapter 2, not only the partner's age but also the partner's sexual function, physical problems, communication, and sexual information are expected to have an impact on female sexual function based on prior research (Carmack Taylor et al., 2004; Fasching et al., 2007; Kingsberg, 2002; Walsh & Berman, 2004). Therefore, future studies should consider including factors such as the partner's sexual function, physical status, mutual communication, and sufficient sexual information to attribute more variance in female sexual function.

Second, the participants' sexual lives before surgery and treatments were not completely evaluated in this study, although one item was included in the demographic

characteristics to ask if the participant had had previous sexual problems or not. This question was too brief to provide an understanding of the participants' previous sexual lives, although women without any cancer were recruited to participate in order to compensate for the weakness of this study and allow the researchers to compare women with gynecological/rectal cancer with controls. However, a longitudinal study would be needed to explore the changes in female sexual function and sexual satisfaction in women with gynecological or rectal cancer over time.

Third, hormone replacement therapy was not a significant factor in predicting female sexual function in this study. However, 20% of women with gynecological or rectal cancer had hormone replacement therapy, and two women in the study expressed that such therapy had worked well for their sexual function. Furthermore, Berman and Goldstein (2001) and Raina et al. (2007) demonstrated that vaginal lubrication and sexual desire were improved through hormone replacement therapy. Therefore, the effect of hormone replacement therapy on female sexual function in women with gynecological or rectal cancer should be further explored.

Fourth, the surgical procedure used to treat gynecological cancer and rectal cancer and the specific types of gynecological cancer were not included in this study as they are related to female sexual function. However, previous studies have addressed various surgical procedures for rectal cancer (McLeish, 2004; Zippe et al., 2006) and gynecological cancer (Andersen & Hacker, 1983; Carmack Taylor et al., 2004; Carter et al., 2004; Jensen et al., 2004; Lamb, 1990; Sevin & Koechli, 2001) that have had different effects on female sexual function. Therefore, further investigation is needed into

the effect of surgical procedures and different types of gynecological cancer on female sexual function. In addition, where the surgery was done could also be explored to test whether different physical facilities influence female sexual function and sexual satisfaction.

According to the findings gleaned from the comments or experiences the participants voluntarily offered, women with gynecological or rectal cancer experienced changes in their bodies after the disease that caused severe sexual pain and negative consequences in the quality of their intimate relationships. Health care providers frequently treated female sexual dysfunction based on the physical symptoms, prescribing lubricants for vaginal dryness and dilators for vaginas that became small. However, women claimed that these sexual treatments did not work as well as they expected because female sexuality is multidimensional, including physical, psychological, social, and spiritual dimensions. Moreover, the women with gynecological or rectal cancer in this study would have liked to have been informed of the sexual changes that would occur before and after the cancer and its treatments. Women also indicated that health care providers should automatically ask them questions about sex to encourage them to feel less embarrassed and more comfortable talking about sexual issues. In future studies, researchers may benefit from incorporating qualitative methods informed by feminist theories to deeply explore female sexuality and its complex dimensions such as body image, relationship power, physical sexual function, and intimate relationships in the lives of women with gynecological or rectal cancer. In addition, researchers may develop a comprehensive understanding of women with

gynecological or rectal cancer before and after the treatment. These examinations may help health care providers provide appropriate and timely sexual information and psychological support in order to improve the quality of care and patients' satisfaction levels.

Summary

This chapter summarized the results of the study; discussed the findings, which described the relationships among body image, anxiety and depression, sexual relationship power, sexual self-schema, female sexual function, and sexual satisfaction for women with gynecological or rectal cancer; and compared the results with previous studies. The limitations and conclusion were stated; further, recommendations were made regarding the conceptual framework, nursing practice, nursing education, and nursing research.

APPENDIX A

(Copyright Permission for the Questionnaires)

Copyright permission for DSFI Body Image Scale

Exhibit A

COPYRIGHT ASSIGNMENT AGREEMENT

This Agreement is effective as of the day of November, 2010 by, and between

Chia-Chun Li, RN, MSN
University of Texas at Austin
4210 Red River #121
Austin, TX 78751
and

Leonard R. Derogatis, Ph.D., President
Clinical Psychometric Research, Inc.
1228 Wine Spring Lane
Towson, MD 21204
(hereinafter "LRD")

Whereas, LRD holds the copyright to a test known as the Derogatis Sexual Functioning Inventory (DSFI) – Body Image Scale for Women, copy attached as Exhibit B;

Whereas, Chia-Chun Li has developed a variant version of the DSFI – Body Image Scale for Women, copy attached as Exhibit C; and

Whereas, Chia-Chun Li desires to assign her copyright throughout the world to her variant version of the DSFI Body Image Scale for Women to LRD, and LRD desires to obtain said copyright,

The parties agree as follows:

Chia-Chun Li assigns and transfers any copyright she might have to the above referenced variant version throughout the world to LRD in consideration of approval by LRD for Chia-Chun Li to use the variant version of the DSFI Body Image Scale for Women, of Exhibit B in her doctoral research project to study the sexual issues of females with and without rectal or gynecological cancer.

For: University of Texas At Austin	Clinical Psychometric Research
_____	_____
Chia-Chun Li, RN, MSN Doctoral Nursing Student	Leonard R. Derogatis, Ph.D. President
_____	_____
Date	Date

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Expected completion date

Dec 2012

Estimated size(pages)

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Total

0.00 USD

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----- Original Message -----
From: Barb Andersen
To: Chia-Chun Li
Sent: Tuesday, September 07, 2010 7:25 AM
Subject: Re: Apply for the permission to use the Women's Sexual Self-Schema Scake

No problem. Just use it.
ba

On 9/7/10 1:14 AM, "Chia-Chun Li" <chiachunli820@mail.utexas.edu> wrote:

Dear Dr. Andersen,

I am Chia-Chun Li, a doctoral student in nursing at the University of Texas at Austin.

I hope to have your permission to use the Sexual Self-Schema Scale-Women's Form in my dissertation. Would you please let me know how to get your permission to use it?

I deeply appreciate your help and look forward to hearing from you.

Sincerely,
Chia-Chun

Copyright permission for FSFI

----- Original Message -----
From: Jules Mitchel
To: Chia-Chun Li
Sent: Wednesday, September 08, 2010 6:21 AM
Subject: RE: Apply for the permission to use the FSFI

You may use the FSFI.

Jules T. Mitchel, MBA, Ph.D.
President
Target Health Inc.
261 Madison Avenue, 24th Floor
New York, NY 10016
Ph 212-681-2100 ext 0
Fax 212-681-2105
Cell 917-992-2428
eFax 928-438-2359
SKYPE drmitchel
julesmitchel@targethealth.com
http://blog.targethealth.com
www.targethealth.com

From: Chia-Chun Li [mailto:chiachunli820@mail.utexas.edu]
Sent: Tuesday, September 07, 2010 2:07 AM
To: info@fsfi-questionnaire.com
Cc: chia-Chun Li
Subject: Apply for the permission to use the FSFI

Dear Sir,

I am Chia-Chun Li, a doctoral student in nursing at the University of Texas at Austin.

I hope to have your permission to use the FSFI in my dissertation. Would you please let me know how to get your permission to use it?

I deeply appreciate your help and look forward to hearing from you.

Sincerely,
Chia-Chun

Copyright permission for ISS

----- Original Message -----
From: service@paypal.com
To: Chia Chun Li
Sent: Monday, November 08, 2010 2:10 AM
Subject: Your payment to Walmyr Publishing Co.

Nov 8, 2010 00:10:23 PST
Receipt No: 3828-9436-3279-1633

Hello Chia Chun Li,
You sent a payment of $160.50 USD to Walmyr Publishing Co..
This charge will appear on your credit card statement as payment to PAYPAL *WALMYRPUBLI.

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Walmyr Publishing Co.
walmyr@walmyr.com
http://www.walmyr.com

Instructions to merchant
None provided

Shipping information
Chia Chun Li
4210 Red River #121
Austin, TX 78751
United States

Shipping method
Default

Description	Unit price	Qty	Amount
Index of Sexual Satisfaction (ISS) Item #: ISS	$25.00 USD	6	$150.00 USD

Shipping:	$10.50 USD
Insurance:	----
Total:	$160.50 USD

Receipt No: 3828-9436-3279-1633
Please keep this receipt number for future reference. You'll need it if you contact customer service at Walmyr Publishing Co. or PayPal.

APPENDIX B

(IRB Approval)

----- Original Message -----
From: Nuno, Olga M
To: 'chiachunli820@mail.utexas.edu'
Cc: Rew, Donna L ; Carrington, Charla T
Sent: Wednesday, December 15, 2010 9:24 AM
Subject: IRB Protocol 2010-11-0050 Approval

Re: Factors Affecting Sexual Function and Sexual Satisfaction among Females with or without Rectal Cancer or Gynecological Cancer

Dear Chia Chun Li:

The protocol for the study listed above has been approved for implementation. The approval letter is attached for your records; please note its instructions. The stamped consent document is for your use when obtaining consent.

Best wishes,

Dr. Olga Nuño, MPH, CIP
IRB Program Coordinator
Office of Research Support
The University of Texas at Austin
North Office Building A, Suite 5.200
PO Box 7426
Austin, TX 78713
Campus Mail Code A3200
Phone: (512) 471-8653
Fax: (512) 471-8873
http://www.utexas.edu/irb

APPENDIX C
(Study Announcement)

Study announcement

Title: Factors Affecting Sexual Function and Sexual Satisfaction among Females with or without Rectal Cancer or Gynecological Cancer

There are two groups in the study, including the study group and the control group.

The study group: You are eligible to participate in this study if you are a female; are 18 years or order; live in U.S. or Canada; are in a relationship or married; read English; have experienced rectal cancer or gynecological cancer surgery for longer than three months; do not have a prior history of any other type of cancer; have finished postoperative chemotherapy and radiotherapy; had no postoperative complications, including wound infections, temporary bladder dysfunction, anastomosis leakage, bleeding, and ostomy complications; and are willing and able to provide information about the research questions.

The control group: You are eligible to participate in this study if you are a female; are 18 years or older; are in a relationship or married; read English; live in U.S. or Canada; not have a history of cancer; and are willing and able to provide information about the research questions.

This study is not only for females with sexual dysfunction but also for females without any sexual dysfunction. You are encouraged to participate in this study if you feel interested in the study and are willing to provide information about the research questions.

Data will be collected by sending a packet consisting of an informed consent form, the set of questionnaires, and a $5 cash incentive and a tea bag of appreciation to your residence. If you are interested in the study, you can contact me by e-mail (chiachunli820@mail.utexas.edu) or phone (512-529-4527).

Your participation includes signing the informed consent form, completing the questionnaires, and returning them to me in the postage-paid envelope.

Risks to participants are considered minimal. All information about you will be kept confidential, and your name will not be connected with any information that you provide. Identification numbers associated with mail and e-mail addresses will be kept during the data collection phase for tracking purposes only.

Contact Information:
Chia-Chun Li, RN, MSN, Doctoral Candidate
The University of Texas at Austin, School of Nursing
4210 Red River #121
Austin, Texas 78751

E-mail address: chiachunli820@mail.utexas.edu
Telephone: 512-529-4527

Advisor: Lynn Rew, EdD, RN, AHN-BC, FAAN
The Denton & Louise Cooley and Family Centennial Professor
E-mail address: ellerew@mail.utexas.edu
Telephone: 512-471-7941

APPENDIX D
(Prenotice Letter)

Prenotice letter for participants with rectal cancer or gynecological cancer

Date:

Dear Madam,

I am writing to ask for your help with an important study I am conducting, as a nursing doctoral candidate at the University of Texas at Austin, to understand factors affecting sexual function and sexual satisfaction among females with gynecological cancer or rectal cancer. In the next few days, you will receive a study packet, including an informed consent form, study materials, and a small token of appreciation, seeking your participation in this study.

I would like to do everything I can to make it easy and comfortable for you to participate in the study. I am writing in advance to let you know that participants will be asked to fill out a set of questionnaires. The research can only be successful with the generous help of people like you.

As a way of saying thanks, you will receive a $5 cash incentive and a tea bag of appreciation along with the request to participate. I hope you will take 40 minutes of your time to help me. Most of all, I hope that you enjoy the questionnaires and the opportunity to voice your feelings and experiences regarding the treatment of gynecological cancer or rectal cancer.

Best wishes,

Chia-Chun Li, RN, Doctoral Candidate
University of Texas at Austin, School of Nursing
E-mail: chiachunli820@mail.utexas.edu
Phone: 512-529-4527
4210 Red River, # 121
Austin, Texas 78751

Prenotice letter for participants without any cancer

Date:

Dear Madam,

I am writing to ask for your help with an important study I am conducting, as a nursing doctoral candidate at the University of Texas at Austin, to understand factors affecting sexual function and sexual satisfaction among females without any cancer. In the next few days you will receive a study packet, including an informed consent, study materials and a small token of appreciation, to participate in this study.

I would like to do everything I can to make it easy and comfortable for you to participate in the study. I am writing in advance to let you know that participants will be asked to fill out a set of questionnaires. The research can only be successful with the generous help of people like you.

As a way of saying thanks, you will receive a $5 cash incentive and a tea bag of appreciation along with the request to participate. I hope you will take 40 minutes of your time to help me. Most of all, I hope that you enjoy the questionnaires and the opportunity to voice your feelings and experiences regarding female sexuality.

Best wishes,

Chia-Chun Li, RN, MSN, Doctoral Candidate
University of Texas at Austin, School of Nursing
E-mail: chiachunli820@mail.utexas.edu
Phone: 512-529-4527
4210 Red River, # 121
Austin, Texas 78751

APPENDIX E
(Cover Letter)

Dear Madam,

My name is Chia-Chun Li, a doctoral candidate in nursing at the University of Texas at Austin, and I am working on a study for my dissertation. The purpose of the study is to examine how rectal or gynecological cancer affects females' sexual function and sexual satisfaction. I am also interested in comparing the differences in sexual function and sexual satisfaction between females with and those without rectal cancer or gynecological cancer.

I want to invite you to participate in this study, and your participation includes signing the informed consent sheet, completing the questionnaires, and returning them to me in the postage-paid envelope. Your participation in the survey will contribute to a better understanding of female sexuality after rectal cancer or gynecological cancer and its differences when compared to that of females without cancer. There will be about 58 women with rectal cancer, 58 women with gynecological cancer, and 116 women without any cancer in this study. I estimate that the questionnaires will take about 40 minutes of your time to complete.

Risks to participants are considered minimal, and there will be no cost to participate. All information about you will be kept confidential, and your name will not be connected with any information that you provide. Identification numbers associated with mail and e-mail addresses will be kept during the data collection phase for tracking purposes only. This information will be stripped from the final dataset.

You are not obligated to participate in this study. You may decline to answer any questions, and you have the right to withdraw from participating at any time without penalty. In appreciation for your participation in this study, you will be reimbursed with a $ 5 cash incentive and a tea bag.

Further information about this study can be found in the accompanying informed consent sheet. If you have any questions about the study, please feel free to contact me.

Sincerely,

Chia-Chun Li, RN, MSN
Doctoral Candidate
The University of Texas at Austin, School of Nursing
4210 Red River #121
Austin, Texas 78751
E-mail: chiachunli820@mail.utexas.edu
512-529-4527

APPENDIX F
(Informed Consent Form)

IRB PROTOCOL #

Title: Factors Affecting Sexual Function and Sexual Satisfaction among Females with or without Rectal Cancer or Gynecological Cancer

Conducted by: Chia-Chun Li, RN, MSN
The University of Texas at Austin, School of Nursing
E-mail address: chiachunli820@mail.utexas.edu; Telephone: 512-529-4527

Advisor: Lynn Rew, EdD, RN, AHN-BC, FAAN
The Denton & Louise Cooley and Family Centennial Professor
E-mail address: ellerew@mail.utexas.edu; Telephone: 512-471-7941

You are being invited to participate in a research study. This form provides you with information about the study. Please read the information below and ask any questions you might have before deciding whether or not to take part. Your participation is entirely voluntary. You can refuse to participate without penalty or loss of benefits to which you are otherwise entitled. You can stop your participation at any time, and your refusal will not impact current or future relationships with UT Austin or participating sites. You can stop participating at any time by simply telling the researcher.

The purpose of this study is to examine the impact of rectal cancer or gynecological cancer on female sexual function and sexual satisfaction and to compare the differences in sexual function and sexual satisfaction between females with rectal cancer or gynecological cancer and females without any cancer. There will be 58 women with rectal cancer, 58 women with gynecological cancer, and 116 women without any cancer (including 58 premenopausal women and 58 postmenopausal women) in this study.

If you agree to be in this study, I will ask you to provide some background information and complete six questionnaires, addressing body image, psychological status, sexual relationship power, sexual self-schema, sexual function, and sexual satisfaction. Some questions are quite personal. The set of questionnaires will take around 40 minutes to complete.

There will be no risks to you except for the inconvenience of the time in answering the questionnaires. The research does not directly benefit you, but your contribution will be helpful in the future for other females diagnosed with rectal cancer or gynecological cancer. Further, the information will be helpful for health care providers trying to understand the effects of rectal cancer or gynecological cancer on female sexuality and its related factors.

The data will contain no identifying information that could associate you with it or with your participation in any study. The questionnaires and coding books for this study will be stored securely and kept confidential by the researchers. Only authorized persons from the University of Texas at Austin, members of the Institutional Review Board, and study sponsors, if any, have the legal right to review your research records and will protect the

confidentiality of those records to the extent permitted by law. All publications will exclude any information that will make it possible to identify you as a subject. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study.

In appreciation for your participation in this study, you will be reimbursed with a $5 cash incentive and a tea bag.

Contacts and Questions:
If you have any questions about the study, please feel free to contact me. If you have questions later, want additional information, or wish to withdraw your participation, you may call me or contact my advisor. Our names, phone numbers, and e-mail addresses are at the top of this form.

If you would like to obtain information about the research study; have questions, concerns, or complaints; or wish to discuss problems about the research study with someone unaffiliated with the study, please contact the IRB Office at (512) 471-8871 or Jody Jensen, Ph.D., Chair, The University of Texas at Austin Institutional Review Board for the Protection of Human Subjects at (512) 232-2685. Anonymity, if desired, will be protected to the extent possible. As an alternative method of contact, an e-mail may be sent to orsc@uts.cc.utexas.edu, or a letter may be sent to IRB Administrator, P.O. Box 7426, Mail Code A 3200, Austin, TX 78713.

If you agree to participate in this study, please sign below. You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information and have sufficient information to make a decision about participating in this study. I consent to participate in the study.

_____
Participant's Signature

_____ _____
Printed Name of Participant Date

_____ _____
Signature of Investigator Date

APPENDIX G
(Questionnaires)

Personal Information Survey

ID #:_____ Date: _____/_____/_____

Thank you very much for taking time to participate in the study. Please answer the following items as completely and as honestly as possible.

Demographic characteristics

1. Age _____ years
2. Education

   ☐ Elementary school ☐ High school ☐ College ☐ Graduate school ☐ others _____
3. Ethnicity

   □ Not Latino/Hispanic/Spanish origin □ Latino/Hispanic/Spanish origin
4. Race

   □ Caucasian ☐ Latino ☐ African-American ☐ Asian □ Native American

   ☐ Others _____
5. Employment Status

   ☐ Not working ☐ Retired ☐ Full-time job ☐ Part-time job ☐ Others _____
6. Personal income from the previous year

   ☐ < $20,000 ☐ $20,001- 35,000 ☐ $35,001-50,000 ☐ $50,001-65,000

   ☐ $65,001-80,000 ☐ $80,001-100,000 ☐ > $100,001
7. Marital Status

   ☐ Single ☐ In a relationship ☐ Married ☐ Separated ☐ Divorced ☐ Widow
8. Gender of current partner □ Man □ Woman
9. Length of time with the current partner _____ years (or _____months)
10. The partner's age _____ years
11. Number of Children

    ☐ None ☐ One ☐ Two ☐ Three ☐ Four ☐ Five ☐ Others (adopted) _____
12. Menopausal Status

    ☐ Pre-menopause ☐ Peri-menopause ☐ Post-menopause ☐ Surgical menopause
13. Hormone replacement therapy ☐ Yes ☐ No
14. Past medical history (mark all that apply)

    ☐ Diabetes ☐ Hypertension ☐ Cardiovascular Disease ☐ Others _____
15. Presence of previous sexual problems ☐ Yes ☐ No

Disease characteristics

1. Type of cancer

   ☐ Rectal cancer (including rectum、anus)

   ☐ Gynecological cancer (including uterus、ovaries、vagina、vulva)

2. Time since surgical operation _____ years (or _____ months)

3. Stage of disease □ stage 0 □ stage 1 □ stage 2 □ stage 3 □ stage 4

4. Recurrence of the disease ☐ Yes ☐ No

5. Are you occurring in the hospice? □ Yes □ No

6. Type of treatment received (mark all that apply)

   ☐ Preoperative radiotherapy ☐ Surgery ☐ Postoperative chemotherapy

   ☐ Postoperative radiation

7. Do you currently have a stoma?

   □ Yes (☐ Temporary stoma or ☐ Permanent stoma)

   □ No (Have you ever had a stoma following surgery? □ Yes □ No)

8. Performance status

   ☐ Full active, able to carry all pre-disease performance without restriction.
   ☐ Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., Light house work, office work.
   ☐ Ambulatory and capable of all selfcare but unable to carry out any work activities. Up and about more than 50% of waking hours.
   ☐ Capable of only limited selfcare, confined to bed or chair more than 50% of waking hours.
   ☐ Completely disabled. Cannot carry on any selfcare. Totally confined to bed or chair.

   - Oken, M. M., Creech, R. H., Tormey, D. C., Horton, J., Davis, T. E., McFadden, E. T., & Carbone, P. P. (1982). Toxicity and response criteria of the Eastern Cooperative Oncology Group. *American Journal of Clinical Oncology*, *5*, 649–655.
   - Credit the Eastern Cooperative Oncology Group, Robert Comis M.D., Group Chair.

DSFI Body Image Scale for Women

Instructions: Below are some statements concerning how you view your body. Please indicate to what degree each of the following statements is true of you by circling the number that best describes your experience.

	Not at all	Slightly	Moderately	Quite a bit	Extremely
1. I am less attractive than I would like to be	0	1	2	3	4
2. I am too fat	0	1	2	3	4
3. I enjoy being seen in a bathing suit	0	1	2	3	4
4. I am too thin	0	1	2	3	4
5. I would be embarrassed to be seen nude by a lover	0	1	2	3	4
6. I am too short	0	1	2	3	4
7. There are parts of my body I don't like at all	0	1	2	3	4
8. I am too tall	0	1	2	3	4
9. I have too much body hair	0	1	2	3	4
10. My face is attractive	0	1	2	3	4
11. I have a shapely and well-proportioned body	0	1	2	3	4
12. I have attractive breasts	0	1	2	3	4
13. Men would find my body attractive	0	1	2	3	4
14. I have attractive legs	0	1	2	3	4
15. I am pleased with the way my vagina looks	0	1	2	3	4

The Hospital Anxiety and Depression Scale (HAD Scale)

Reference: Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta psychiatrica Scandinavica, 67*, 361–370.

Sexual Relationship Power Scale

Relationship Control Factor/Subscale

Each of the following items was scored on a 4-point Likert scale, where **1 = Strongly Agree, 2 = Agree, 3 = Disagree, and 4 = Strongly disagree.**

____1. Most of the time, we do what my partner wants to do.

____2. My partner won't let me wear certain things.

____3. When my partner and I are together, I'm pretty quiet.

____4. My partner has more say than I do about important decisions that affect us.

____5. My partner tells me who I can spend time with.

____6. I feel trapped or stuck in our relationship.

____7. My partner does what he wants, even if I do not want him to.

____8. I am more committed to our relationship than my partner is.

____9. When my partner and I disagree, he gets his way most of the time.

____10. My partner gets more out of our relationship than I do.

____11. My partner always wants to know where I am.

____12. My partner might be having sex with someone else.

Decision-Making Dominance Factor/Subscale

Each of the following items was scored in the following manner: **1 = Your Partner, 2 = Both of You Equally, and 3 = You.**

____13. Who usually has more say about whose friends to go out with?

____14. Who usually has more say about whether you have sex?

____15. Who usually has more say about what you do together?

____16. Who usually has more say about how often you see one another?

____17. Who usually has more say about when you talk about serious things?

____18. In general, who do you think has more power in your relationship?

____19. Who usually has more say about what types of sexual acts you do?

Sexual Self-Schema Scale - Women's Form

Directions: Below is a listing of 50 adjectives. For each word, consider whether or not the term describes you. Each adjective is to be rated on a scale ranging from **0 = *not at all descriptive of me* to 6 = *very much descriptive of me*. Choose a number of each adjective to indicate how accurately the adjective describes you.** There are no right or wrong answers. Please be thoughtful and honest.

Question: To what extent does the term _____ describe me?

Rating Scale:

Not at all descriptive	0	1	2	3	4	5	6	Very descriptive

____ 1. Generous	____26. Disagreeable
____ *2. Uninhibited*	____27. Serious
____ *3. Cautious*	____*28. Prudent*
____ 4. Helpful	____29. Humorous
____ *5. Loving*	____30. Sensible
____ *6. Open-minded*	____*31. Embarrassed*
____ 7. Shallow	____*32. Outspoken*
____ *8. Timid*	____33. Level-headed
____ *9. Frank*	____34. Responsible
____10. Clean-cut	____*35. Romantic*
____*11. Stimulating*	____36. Polite
____12. Unpleasant	____*37. Sympathetic*
____*13. Experienced*	____*38. Conservative*
____14. Short-tempered	____*39. Passionate*
____15. Irresponsible	____40. Wise
____*16. Direct*	____*41. Inexperienced*
____17. Logical	____42. Stingy
____*18. Broad-minded*	____43. Superficial
____19. Kind	____*44. Warm*
____*20. Arousable*	____*45. Unromantic*
____21. Practical	____46. Good-natured
____*22. Self-conscious*	____47. Rude
____23. Dull	____*48. Revealing*
____*24. Straightforward*	____49. Bossy
____*25. Casual*	____*50. Feeling*

Reference: Andersen, B. L., & Cyranowski, J. M. (1994). Women's sexual self-schema. *Journal of Personality and Social Psychology, 67*, 1079–1100.

Female Sexual Function Index (FSFI)

Reference: Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., … D'Agostino, R. (2000). The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex and Marital Therapy, 26,* 191–208.

Index of Sexual Satisfaction (ISS)

Reference: Walmyr Publishing Co. (1997). *The Walmyr assessment scales scoring manual*. Tallahassee, FL: W. W. Hudson.

APPENDIX H
(Reminder Letter)

Dear potential participant,

Time passes so fast. Approximately four weeks ago, I sent you a package of the study materials to invite you to join in a study related to sexual function and sexual satisfaction for females with or without rectal or gynecological cancer. Your participation will be important to help health care providers understand this phenomenon more completely and to provide appropriate caring interventions and strategies in the future.

If you are interested in this study, please take a few minutes to finish the questionnaires and return them in the postage-paid envelope. If you have any questions about this study, please do not hesitate to contact me.

If you have already completed the questionnaires and returned them, please disregard this notice.

If you have decided not to participate in the study and don't want to be bothered further, please write "RETURN" or "Decline" on the front of the envelope and mail it back. After I receive it, I won't contact you again.

Thank you very much for your support of this study.

Sincerely,

Chia-Chun Li, RN, MSN
Doctoral Candidate
University of Texas at Austin, School of Nursing
E-mail: chiachunli820@mail.utexas.edu
Phone: 512-529-4527
4210 Red River #121
Austin, Texas 78751

APPENDIX I
(Thank You Letter)

Dear participant,

Thank you so much for your kind and thoughtful participation in the study entitled "Factors Affecting Sexual Function and Sexual Satisfaction among Females with or without Rectal Cancer or Gynecological Cancer."

I have received the returned envelope, and you have completed all of the questionnaires.

Thank you very much for your support of this study.

Sincerely,

Chia-Chun Li, RN, MSN
Doctoral Candidate
University of Texas at Austin, School of Nursing
4210 Red River #121
Austin, Texas 78751
512-529-4527
E-mail: chiachunli820@mail.utexas.edu

APPENDIX J
(Follow-Up Letter)

Date:

Dear potential participant,

I hope you do not mind my contacting you again. I would like to invite you to participate in the study related to sexual function and sexual satisfaction for females with or without rectal or gynecological cancer. Your participation will help health care providers understand this phenomenon more completely so they can provide appropriate caring interventions and strategies in the future.

If you still feel interested in this study, please take a few minutes to finish the questionnaires and return them in the postage-paid envelope. If you didn't receive the study materials or the study package was lost, please let me know and I will send you a new study package.

If you are not interested in participating, you do not need to do anything. This is the final time I will contact you.

If you have any questions about this study, please do not hesitate to contact me. Thank you very much for your support of this study.

Sincerely,

Chia-Chun Li, RN, MSN
Doctoral Candidate
University of Texas at Austin, School of Nursing
4210 Red River #121
Austin, Texas 78751
512-529-4527
E-mail: chiachunli820@mail.utexas.edu

References

Aerts, L., Enzlin, P., Verhaeghe, J., Vergote, I., & Amant, F. (2009). Sexual and psychological functioning in women after pelvic surgery for gynaecological cancer. *European Journal of Gynaecological Oncology, 6*, 652–656.

Alder, J., Zanetti, R., Wight, E., Urech, C., Fink, N., & Bitzer, J. (2008). Sexual dysfunction after premenopausal stage I and II breast cancer: Do androgens play a role? *The Journal of Sexual Medicine, 5*, 1898–1906.

Althof, S. E., Rosen, R. C., Derogatis, L., Corty, E., Quirk, F., & Symonds, T. (2005). Outcome measurement in female sexual dysfunction clinical trials: Review and recommendations. *Journal of Sex and Marital Therapy, 31*, 153–166.

Anastasiadis, A. G., Davis, A. R., Ghafar, M. A., Burchardt, M., & Shabsigh, R. (2002). The epidemiology and definition of female sexual disorders. *World Journal of Urology, 20*, 74–78.

Andersen, B. L. (1999). Surviving cancer: The importance of sexual self-concept. *Medical and Pediatric Oncology, 33*, 12–23.

Andersen, B. L. (1993). Predicting sexual and psychological morbidity and improving quality of life for women with gynecological cancer. *Cancer, 71*, 1678–1690.

Andersen, B. L., & Cyranowski, J. M. (1994). Women's sexual self-schema. *Journal of Personality and Social Psychology, 67*, 1079–1100.

Andersen, B. L., & Does, J. V. D. (1994). Surviving gynecological cancer and coping with sexual morbidity: An international problem. *International Journal of Gynecological Cancer, 4*, 225–240.

Andersen, B. L., & Elliot, M. L. (1993). Sexuality for women with cancer: Assessment, theory, and treatment. *Sexuality and Disability, 11*(1), 7–37.

Andersen, B., & Hacker, N. (1983). Psychosexual adjustment after vulvar surgery. *Obstetrics of Gynecology, 62,* 457–462.

Andersen, B. L., Lachenbruch, P. A., Anderson, B., & Deprosse, C. (1986). Sexual dysfunction and signs of gynecologic cancer. *Cancer, 57*, 1880–1886.

Andersen, B. L., & Legrand, J. (1991). Body image for women: Conceptualization, assessment, and a test of its importance to sexual dysfunction and medical illness. *The Journal of Sex Research, 28*, 457–477.

Andersen, B. L., Woods, X. A., & Copeland, L. J. (1997). Sexual self-schema and sexual morbidity among gynecological cancer survivors. *Journal of Consulting and Clinical Psychology, 65*, 221–229.

Andersen, B. L., Woods, X., & Cyranowski, J. (1994). Sexual self-schema as a possible predictor of sexual problems following cancer treatment. *The Canadian Journal of Human Sexuality, 3*, 165–170.

Ashing-Giwa, K. T., Padilla, G., Tejero, J., Kraemer, J., Wright, K., Coscarelli, A., … Hills, D. (2004). Understanding the breast cancer experience of women: A qualitative study of African American, Asian American, Latina and Caucasian cancer survivors. *Psycho-Oncology, 13*, 408–428.

Au, T.-Y. (2009). Perceived stress, spirituality, resourcefulness and sexuality in patients with rectal cancer undergoing cancer treatment (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3393114)

Bakht, S., & Najafi, S. (2010). Body image and sexual dysfunctions: Comparison between breast cancer patients and healthy women. *Procedia Social and Behavioral Sciences, 5*, 1493–1497.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.

Basson, R. (2001a). Human sex-response cycles. *Journal of Sex and Marital Therapy, 27*, 33–43.

Basson, R. (2001b). Using a different model for female sexual response to address women's problematic low sexual desire. *Journal of Sex and Marital Therapy, 27*, 395–403.

Basson, R. (2000). The female sexual response: A different model. *Journal of Sex and Marital Therapy, 26*, 51–65.

Basson, R., Berman, J., Burnett, A., Derogatis, L., Ferguson, D., Fourcroy, J., … Whipple, B. (2000). Report of the international development conference on female sexual dysfunction: Definitions and classifications. *The Journal of Urology, 163*, 888–893.

Basson, R., Leiblum, S., Brotto, L., Derogatis, L., Fourcroy, J., Fugl-Meyer, K., … Schultz, W. W. (2003). Definitions of women's sexual dysfunction reconsidered: Advocating expansion and revision. *Journal of Psychosomatic Obstetrics and Gynaecology, 24*, 221–229.

Bay-Cheng, L. Y., & Zucker, A. N. (2007). Feminism between the sheets: Sexual

attitudes among feminists, nonfeminists, and egalitarians. *Psychology of Women Quarterly, 31*, 157–163.

Becker, M., Malafy, T., Bossart, M., Henne, K., Gitsch, G., & Denschlag, D. (2011). Quality of life and sexual functioning in endometrial cancer survivors. *Gynecologic Oncology, 121*, 169–173.

Bedford, A., Pauw, K. D., & Grant, E. (1997). The structure of the Hospital Anxiety and Depression Scale (HAD): An appraisal with normal, psychiatric and medical patient subjects. *Personality and Individual Differences, 23*, 473–478.

Benrud-Larson, L. M., Heinberg, L. J., Boling, C., Reed, J., White, B., Wigley, F. M., & Haythornthwaite, J. A. (2003). Body image dissatisfaction among women with scleroderma: Extent and relationship to psychosocial function. *Health Psychology, 22*, 130–139.

Berard, R. M., Boermeester, F., & Viljoen, G. (1998). Depressive disorder in an outpatient oncology setting: Prevalence, assessment, and management. *Psycho-Oncology, 7*, 112–120.

Bergmark, K., Avall-Lundqvist, E., Dickman, P. W., Henningshohn, L., & Steineck, G. (1999). Vaginal changes and sexuality in women with a history of cervical cancer. *The New England Journal of Medicine, 340*, 1383–1389.

Berman, J. R., & Goldstein, I. (2001). Female sexual dysfunction. *The urologic clinics of North America, 28*, 405–416.

Bisseling, K. C. H. M., Kondalsamy-Chennakesavan, S., Bekkers, R. L. M., Janda, M., & Obermair, A. (2009). Depression, anxiety and body image after treatment for

invasive stage one epithelial ovarian cancer. *Australian and New Zealand Journal of Obstetrics and Gynaecology, 49*, 660–666.

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale: An updated literature review. *Journal of Psychosomatic Research, 52*, 69–77.

Blanc, A. K. (2001). The effect of power in sexual relationships on sexual and reproductive health: An examination of the evidence. *Studies in Family Planning, 32,* 189–213.

Bodurka, D. C., & Sun, C. C. (2006). Sexual function after gynecologic cancer. *Obstetrics and Gynecology Clinics of North America, 33*, 621–630.

Böhm, G., Kirschner-Hermanns, R., Decius, A., Heussen, N., Schumpelick, V., & Willis, S. (2008). Anorectal, bladder, and sexual function in females following colorectal surgery for carcinoma. *International Journal of Colorectal Disease, 23*, 893–900.

Boscaglia, N., Clarke, D. M., Jobling, T. W., & Quinn, M. A. (2005). The contribution of spirituality and spiritual coping to anxiety and depression in women with a recent diagnosis of gynecological cancer. *International Journal of Gynecological Cancer, 15*, 755–761.

Bradford, A., & Meston, C. (2007). Sexual outcomes and satisfaction with hysterectomy: Influence of patient education. *Journal of Sexual Medicine, 4*, 106–114.

Breslau, N., Schultz, L., & Peterson, E. (1995). Sex differences in depression: A role for preexisting anxiety. *Psychiatry Research, 58*(1), 1–12.

Brezsnyak, M., & Whisman, M. A. (2004). Sexual desire and relationship functioning: The effects of marital satisfaction and power. *Journal of Sex and Marital Therapy, 30*, 199–217.

Bronisch, T., & Wittchen, H.-U. (1994). Suicidal ideation and suicide attempts: Comorbidity with depression, anxiety disorders, and substance abuse disorder. *European Archives of Psychiatry and Clinical Neuroscience, 244*, 93–98.

Bruheim, K., Tveit, K. M., Skovlund, E., Balteskard, L., Carlsen, E., Fossa, S. D., & Guren, M. G. (2010). Sexual function in females after radiotherapy for rectal cancer. *Acta Oncologica, 49*, 826–832.

Bukovic, D., Silovski, H., Silovski, T., Hojsak, I., Sakic, K., & Hrgovic, Z. (2008). Sexual functioning and body image of patients treated for ovarian cancer. *Sexuality and Disability, 26*, 63–73.

Burns, M., Costello, J., Ryan-Woolley, B., & Davidson, S. (2007). Assessing the impact of late treatment effects in cervical cancer: An exploratory study of women's sexuality. *European Journal of Cancer Care, 16*, 364–372.

Butler, L., Banfield, V., Sveinson, T., & Allen, K. (1998). Conceptualizing sexual health in cancer care. *Western Journal of Nursing Research, 20*, 683–699.

Butzer, B., & Campbell, L. (2008). Adult attachment, sexual satisfaction, and relationship satisfaction: A study of married couples. *Personal Relationships, 15*, 141–154.

Byers, E. S. (2001). Evidence for the importance of relationship satisfaction for women's sexual functioning. *Women and Therapy, 24*, 23–26.

Byers, E. S. (2005). Relationship satisfaction and sexual satisfaction: A longitudinal study of individuals in long-term relationships. *Journal of Sex Research, 42,* 113–118.

Calogero, R. M., & Thompson, J. K. (2009). Potential implications of the objectification of women's bodies for women's sexual satisfaction. *Body Image, 6,* 145–148.

Camilleri-Brennan, J., & Steele, R. J. C. (2001). Prospective analysis of quality of life and survival following mesorectal excision for rectal cancer. *British Journal of Surgery, 88,* 1617–1622.

Carmack Taylor, C. L., Basen-Engquist, K., Shinn, E. H., & Bodurka, D. C. (2004). Predictors of sexual functioning in ovarian cancer patients. *Journal of Clinical Oncology*, *22*, 881–889.

Carpenter, K. M., Andersen, B. L., Fowler, J. M., & Maxwell, G. L. (2009). Sexual self-schema as a moderator of sexual and psychological outcomes for gynecological cancer survivors. *Archives of Sexual Behavior, 38,* 828–841.

Carter, J., Chi, D. S., Abu-Rustum, N., Brown, C. L., McCreath, W., & Barakat, R. R. (2004). Brief report: Total pelvic exenteration—A retrospective clinical needs assessment. *Psycho-Oncology, 13*, 125–131.

Cartwright-Alcarese, F. (1995). Addressing sexual dysfunction following radiation therapy for gynecologic malignancy. *Oncology Nursing Forum*, *22*, 1227–1232.

Centers for Disease Control and Prevention. (n.d.). Deaths and Mortality. Retrieved October 26, 2009, from http://www.cdc.gov/nchs/FASTATS/deaths.htm

Chambers, C. (2005). Masculine domination, radical feminism and change. *Feminist*

Theory, 6, 325–346.

Cleary, V., Hegarty, J., & McCarthy, G. (2011). Sexuality in Irish women with gynecologic cancer. *Oncology Nursing Forum, 38*, E87–E96.

Cohen, J., Cohen, P., West, S., & Aiken, L. (2003). *Applied multiple regression/correlation analysis for the behavior sciences*. Mahwah, NJ: Lawrence Erlbaum Associates.

Cohen, M. Z., Kahn, D. L., & Steeves, R. H. (1998). Beyond body image: The experience of breast cancer. *Oncology Nursing Forum, 25*, 835–841.

Connell, R. W. (Ed.). (1987). *Gender and power*. Oxford: Polity Press.

Corney, R. H., Crowther, M. E., Everett, H., Howells, A., & Shepherd, J. H. (1993). Psychosexual dysfunction in women with gynecological cancer following radical pelvic-surgery. *British Journal of Obstetrics and Gynaecology, 100*(1), 73–78.

Crago, M., & Shisslak, C. M. (2003). Ethnic differences in dieting, binge eating, and purging behaviors among American females: A review. *Eating Disorders, 11*, 289–304.

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions.* Thousand Oaks, CA: Sage Publications.

Crowe, P. J., Temple, W. J., Lopez, M. J., & Ketchman, A. S. (1999). Pelvic exenteration for advanced pelvic malignancy. *Seminars in Surgical Oncology, 17*, 152–160.

Cyranowski, J. M., Aarestad, S. L., & Andersen, B. L. (1999). The role of sexual self-schema in a diathesis-stress model of sexual dysfunction. *Applied and Preventive Psychology, 8*, 217–228.

Da Silva, G. M., Hull, T., Roberts, P. L., Ruiz, D. E., Wexner, S. D., Weiss, E. G., … Sands, D. (2008). The effect of colorectal surgery in female sexual function, body image, self-esteem and general health: A prospective study. *Annals of Surgery, 248,* 266–272.

Dagnan, D., Chadwick, P., & Trower, P. (2000). Psychometric properties of the Hospital Anxiety and Depression Scale with a population of members of a depression self-help group. *The British Journal of Medical Psychology, 73*, 129–137.

Davison, T. E., & McCabe, M. P. (2005). Relationships between men's and women's body image and their psychological, social, and sexual functioning. *Sex Roles, 52,* 463–475.

Densmore, D. (1973). Independence from the sexual revolution. In A. Koedt, E. Levine, & A. Rapone (Eds.), *Radical feminism* (pp. 107–118). New York: Quadrangle.

Derogatis, L. R. (1998). The Derogatis Sexual Functioning Inventory. In C. M. Davis, W. L. Yarber, R. Bauserman, G. Schreer, & S. L. Davis (Eds.), *Handbook of sexuality-related measures* (pp. 129–131). Thousand Oaks, CA: Sage.

Derogatis, L. R., & Melisaratos, N. (1979). The DSFI: A multidimensional measurement of sexual functioning. *Journal of Sex and Marital Therapy, 5*, 244–281.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail and mixed-mode surveys: The tailored design method* (3rd ed.). Hoboken, NJ: John Wiley & Sons, Inc.

Donaghue, N. (2009). Body satisfaction, sexual self-schemas and subjective well-being in women. *Body Image, 6,* 37–42.

Donovan, K. A., Taliaferro, L. A., Alvarez, E. M., Jacobsen, P. B., Roetzheim, R. G., & Wenham, R. M. (2007). Sexual health in women treated for cervical cancer: Characteristics and correlates. *Gynecologic Oncology, 104*, 428–434.

Dudley, W. N., Benuzillo, J. G., & Carrico, M. S. (2004). SPSS and SAS programming for the testing of mediation models. *Nursing Research, 53*(1), 59–62.

Dundon, C. M., & Rellini, A. H. (2010). More than sexual function: Predictors of sexual satisfaction in a sample of women age 40–70. *Journal of Sexual Medicine, 7*, 896–904.

Dunn, K. M., Croft, P. R., & Hackett, G. I. (1999). Association of sexual problems with social, psychological, and physical problems in men and women: A cross sectional survey. *Journal of Epidemiology and Community Health, 53*, 144–148.

Dworkin, A. (1987). Possession. In A. Dworkin (Ed.), *Intercourse* (pp. 63–79). New York: A Division of Simon & Schuster Inc.

Ekwall, E., Ternestedt, B-M., & Sorbe, B. (2003). Important aspects of health care for women with gynecological cancer. *Oncology Nursing Forum, 30*, 313–319.

Elo, S., & Kyngas, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107–115.

Engel, J., Kerr, J., Schlesinger-Raab, A., Eckel, R., Sauer, H., & Holzel, D. (2003). Quality of life in rectal cancer patients: A four-year prospective study. *Annals of Surgery, 238*, 203–213.

Enzlin, P., Mathieu, C., Van Den Bruel, A., Bosteels, J., Vanderschueren, D., & Demyttenaere, K. (2002). Sexual dysfunction in women with type 1 diabetes: A

controlled study. *Diabetes Care, 25*, 672–677.

Fasching, P. A., Nicolaisen-Murmann, K., Lux, M. P., Bender, H. G., Ackermann, S., Beckmann, M. W., & Bani, M. R. (2007). Changes in satisfaction in patients with gynecological and breast malignancies: An analysis with the socio-economic satisfaction and quality of life questionnaire. *European Journal of Cancer Care, 16*, 508–516.

Ferenidou, F., Kapoteli, V., Moisidis, K., Koutsogiannis, I., Giakoumelos, A., & Hatzichristou, D. (2008). Presence of a sexual problem may not affect women's satisfaction from their sexual function. *The Journal of Sexual Medicine, 5*, 631–639.

Ferroni, P., & Taffe, J. (1997). Women's emotional well-being: The importance of communicating sexual needs. *Sexual and Marital Therapy, 12*, 127–138.

Field, A. (2005). Regression. In A. Field (Ed.), *Discovering statistics using SPSS* (2nd ed.). (pp. 143–217). Thousand Oaks, CA: Sage Publications Inc.

Field, A. (2009). Exploring assumptions. In A. Field (Ed.), *Discovering statistics using SPSS* (3rd ed.). (pp. 143–217). Thousand Oaks, CA: Sage Publications Inc.

Franco, K., Belinson, J., Casey, G., Plummer, S., Tamburrino, M., & Tung, E. (2000). Adjustment to perceived ovarian cancer risk. *Psycho-Oncology, 9*, 411–417.

Frank, D., Dornbush, R., Webster, S., & Kolodny, R. (1978). Mastectomy and sexual behavior: A pilot study. *Sexuality and Disability, 1*(1), 16–26.

Frank, J. E., Mistretta, P., & Will J. (2008). Diagnosis and treatment of female sexual dysfunction. *American Family Physician, 77*, 635–642.

Frumovitz, M., Sun, C. C., Schover, L. R., Munsell, M. F., Jhingran, A., Wharton, J. T., … Bodurka, D. C. (2005). Quality of life and sexual functioning in cervical cancer survivors. *Journal of Clinical Oncology, 23*, 7428–7436.

Fucini, C., Gattai, R., Urena, C., Bandettini, L., & Elbetti, C. (2008). Quality of life among five-year survivors after treatment for very low rectal cancer with or without a permanent abdominal stoma. *Annals of Surgical Oncology, 15*, 1099–1106.

Garos, S., Kluck, A., & Aronoff, D. (2007). Prostate cancer patients and their partners: Differences in satisfaction indices and psychological variables. *The Journal of Sexual Medicine, 4*, 1394–1403.

Gervaz, P., Bucher, P., Konrad, B., Morel, P., Beyeler, S., Lataillade, L., & Allal, A. (2008). A prospective longitudinal evaluation of quality of life after abdominoperineal resection. *Journal of Surgical Oncology, 97*, 14–19.

Goldstein, I., & Berman, J. R. (1998). Vasculogenic female sexual dysfunction: Vaginal engorgement and clitoral erectile insufficiency syndromes. *International Journal of Impotence Research, 10*(suppl 2), S84–90. Discussion S98–101.

Grabe, S., & Hyde, J. S. (2006). Ethnicity and body dissatisfaction among women in the United States: A meta-analysis. *Psychological Bulletin, 132*, 622–640.

Gray-Little, B., & Burks, N. (1983). Power and satisfaction in marriage: A review and critique. *Psychological Bulletin, 93*, 513–538.

Greenwald, H. P., & McCorkle, R. (2008). Sexuality and sexual function in long-term survivors of cervical cancer. *Journal of Women's Health, 17*, 955–963.

Greimel, E. G., Winter, R., Kapp, K. S., & Haas, J. (2009). Quality of life and sexual function after cervical cancer treatment: A long-term follow-up study. *Psycho-Oncology*, *18*, 476–482.

Grigoriadis, S., & Robinson, G. E. (2007). Gender issues in depression. *Annals of Clinical Psychiatry*, *19*, 247–255.

Guo, B., & Hung, J. (2005). Marital and sexual satisfaction in Chinese families: Exploring the moderating effects. *Journal of Sex and Marital Therapy*, *31*, 21–29.

Guren, M. G., Eriksen, M. T., Wiig, J. N., Carlsen, E., Nesbakken, A., Sigurdsson, H. K., … Tveit, K. M. (2005). Quality of life and functional outcome following anterior or abdominoperineal resection for rectal cancer. *European Journal of Surgical Oncology*, *31*, 735–742.

Halbreich, H. (1997). Role of estrogen in postmenopausal depression. *Neurology, 48* (Suppl 7), S16–S20.

Hall, J. M., & Steven, P. E. (1991). Rigor in feminist research. *Advances in Nursing Science*, *13*, 16–29.

Halloran, E. C. (1998). The role of marital power in depression and marital distress. *American Journal of Family Therapy, 26*, 3–14.

Hamilton, A. B. (1999). Psychological aspects of ovarian cancer. *Cancer Investigation, 17*, 335–341.

Harding, S. G. (1986). From the women question in science to the science question in feminism. In S. G. Harding (Ed.), *The science question in feminism* (pp. 15–29). Ithaca, NY: Cornell University.

Harding, S. (1991). What is feminist epistemology? In S. Harding (Ed.), *Whose science? Whose knowledge? Thinking from women's lives* (pp. 105–137). Ithaca, NY: Cornell University.

Harris, R., Good, R. S., & Pollack, L. (1982). Sexual behavior of gynecological cancer patients. *Archives of Sexual Behavior, 11*, 503–510.

Harvey, S. M., Beckman, L. J., Browner, C. H., & Sherman, C. A. (2002). Relationship power, decision making, and sexual relations: An exploratory study with couples of Mexican origin. *Journal of Sex Research, 39,* 284–291.

Hawighorst-Knapstein, S., Fusshoeller, C., Franz, C., Trautmann, K., Schmidt, M., Pilch, H., … Koelbl, H. (2004). The impact of treatment for genital cancer on quality of life and body image: Results of a prospective longitudinal 10-year study. *Gynecologic Oncology, 94,* 398–403.

Hendren, S. K., O'Connor, B. I., Liu, M., Asano, T., Cohen, Z., Swallow, C. J., … McLeod, R. S. (2005). Prevalence of male and female sexual dysfunction is high following surgery for rectal cancer. *Annals of Surgery, 242*, 212–223.

Hinz, A., Krauss, O., Hauss, J. P., Hockel, M., Kortmann, R. D., Stolzenburg, J. U., & Schwarz, R. (2010). Anxiety and depression n cancer patients compared with the general population. *European Journal of Cancer Care, 19*, 522–529.

Hite, S. (1993). Sexuality as a social construction: Toward a new theory of female sexuality. In S. Hite (Ed.), *Women as revolutionary agents of change* (pp. 33–36). Madison, WI: the University of Wisconsin Press.

Hojo, K., Vernava, A. M., Sugihara, K., & Katumata, K. (1991). Preservation of urine voiding and sexual function after rectal cancer surgery. *Diseases of the Colon and Rectum, 34,* 532–539.

Huang, A. J., Subak, L. L., Thom, D. H., Van Den Eden, S. K., Ragins, A. I., Kuppermann, M., Shen, H., & Brown J. S. (2009). Sexual function and aging in racially and ethnically diverse women. *Journal of the American Geriatrics Society, 57,* 1362–1368.

Hudson, W. W., Harrison, D. F., & Crosscup, P. C. (1981). A short-form scale to measure sexual discord in dyadic relationships. *Journal of Sex Research, 17,* 157–174.

Hughes, M. K. (2008). Alterations of sexual function in women with cancer. *Seminars in Oncology Nursing, 24,* 91–101.

Hughes, M. K. (1996). Sexuality issues: Keeping your cool. *Oncology Nursing Forum, 23*, 1597–1600.

Hurlbert, D. F., & Apt, C. (1994). Female sexual desire, response, and behavior. *Behavior Modification, 18,* 488–504.

Jackson, J. K. (2005). Sexual relationship power and gender socialization roles as predictor variables for beliefs about condoms, self-efficacy to use condoms, and condom use for African-American women (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3181552).

Jensen, P. T., Groenvold, M., Klee, M. C., Thranov, I., Petersen, M. A., & Machin, D. (2004). Early stage cervical cancer, radical hysterectomy and sexual function: A longitudinal study. *Cancer, 100*(1), 97–106.

Johnson, F., & Wardle, J. (2005). Dietary restraint, body dissatisfaction, and psychological distress: A prospective analysis. *Journal of Abnormal Psychology, 114*(1), 119–125.

Junkin, J., & Beitz, J. M. (2005). Sexuality and the person with a stoma: Implications for comprehensive WOC nursing practice. *Journal of Wound, Ostomy, and Continence Nursing, 32*, 121–130.

Juraskova, I., Butow, P., Robertson, R., Sharpe, L., McLeod, C., & Hacker, N. (2003). Post-treatment sexual adjustment following cervical and endometrial cancer: A qualitative insight. *Psycho-Oncology, 12*, 267–279.

Keating, J. P. (2004). Sexual function after rectal excision. *ANZ Journal of Surgery, 74*, 248–259.

Ketchen, B., Armistead, L., & Cook, S. (2009). HIV infection, stressful life events, and intimate relationship power: The moderating role of community resources for Black South African women. *Women and Health, 49*, 197–241.

Khanna, J. (2004). *Progress in reproductive health research: Sexual health—A new focus for WHO*. Retrieved from Department of Reproductive Health and Research, World Health Organization, Geneva, Switzerland.

Kilic, E., Taycan, O., Belli, A. K., & Ozmen, M. (2007). The effect of permanent ostomy on body image, self-esteem, marital adjustment, and sexual functioning. *Turkish*

Journal of Psychiatry, *18*(4), 1–8.

Kingsberg, S. A. (2002). The impact of aging on sexual function in women and their partners. *Archives of Sexual Behavior, 31*, 431–437.

Kinsey, A. C., Pomeroy, W. B., Martin, C. E., & Gebhard, P. H. (1953). Psychological factors in sexual response. In A. C. Kinsey, W. B. Pomeroy, C. E. Martin, & P. H. Gebhard (Eds.), *Sexual behavior in the human female* (pp. 642–689). Philadelphia, PA: W. B. Saunders Company.

Kotronoulas, G., Papadopoulou, C., & Patiraki, E. (2009). Nurses' knowledge, attitudes, and practices regarding provision of sexual health care in patients with cancer: Critical review of the evidence. *Support Care Cancer, 17*, 479–501.

Krant, M. J. (1981). Psychosocial impact of gynecological cancer. *Cancer*, *48*, 608–612.

Kreps, B. (1973). Radical feminism. In A. Koedt, E. Levine, & A. Rapone (Eds.), *Radical feminism* (pp. 234–239). New York: Quadrangle.

Kritcharoen, S., Suwan, K., & Jirojwong, S. (2005). Perceptions of gender roles, gender power relationships, and sexuality in Thai women following diagnosis and treatment for cervical cancer. *Oncology Nursing Forum, 32*, 682–688.

Krouse, R. S., Herrinton, L. J., Grant, M., Wendel, C. S., Green, S. B., Mohler, M. J., … Hornbrook, M. C. (2009). Health-related quality of life among long-term rectal cancer survivors with an ostomy: Manifestations by sex. *Journal of Clinical Oncology*, *27*, 4664–4670.

Lamb, M. A. (1990). Psychosexual issues: The women with gynecological cancer. *Seminars in Oncology Nursing, 6*, 237–243.

Lange, M. M., Marijnen, C. A. M., Maas, C. P., Putter, H., Rutten, H. J., Stiggelbout, A. M., … Van de Velde, C. J. H. (2009). Risk factors for sexual dysfunction after rectal cancer treatment. *European Journal of Cancer, 45*, 1578–1588.

Lau, J. T. F., Yang, X., Wang, Q., Cheng, Y., Tsui, H. Y., Mui, L. W. H., & Kim, J. H. (2006). Gender power and marital relationship as predictors of sexual dysfunction and sexual satisfaction among young married couples in rural China: A population-based study. *Urology, 67*, 579–585.

Laumann, E. O., Paik, A., & Rosen, R. C. (1999). Sexual dysfunction in the United States: Prevalence and predictors. *The Journal of the American Medical Association, 281*, 537–544.

Lawrance, K.-A., & Byers, S. (1995). Sexual satisfaction in long-term heterosexual relationships: The interpersonal exchange model of sexual satisfaction. *Personal Relationships, 2*, 267–285.

Leckenby, D. (2007). Feminist empiricism: Challenging gender bias and "setting the record straight." In S. N. Hesse-Biber & P. L. Leavy (Eds.), *Feminist research practice* (pp. 27–52). Thousand Oaks, CA: Sage.

Leiblum, S. R. (2002). Reconsidering gender differences in sexual desire: An update. *Sexual and Relationship Therapy, 17*(1), 57–68.

Leiblum, S. R. (1998). Definition and classification of female sexual disorders. *International Journal of Impotence Research, 10* (suppl. 2), 102–106.

LeMoncheck, L. (1997). What is a feminist philosophy of sex? In L. LeMoncheck (Ed.), *Loose women, lecherous men: A feminist philosophy of sex* (pp. 9–27). New York: Oxford.

Lemone, P. (1996). The physical effects of diabetes on sexuality in women. *The Diabetes Educator, 22*, 361–366.

Li, C. C. (2009). Sexuality among patients with a colostomy: An exploration of the influences of gender, sexual orientation, and Asian heritage. *Journal of Wound, Ostomy, and Continence Nursing, 36*, 288–296.

Likes, W. M., Stegbauer, C., Hathaway, D., Brown, C., & Tillmanns, T. (2006). Use of the female sexual function index in women with vulvar intraepithelial neoplasia. *Journal of Sex and Marital Therapy*, *32*, 255–266.

MacKinnon, C. A. (2002). Pleasure under patriarchy. In C. L. Williams, & A. Stein (Eds.), *Sexuality and gender* (pp. 33–43). Malden, MA: Blackwell Publishers Inc.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*(1), 83–104.

MacNeil, S., & Byers, E. S. (1997). The relationships between sexual problems, communication, and sexual satisfaction. *The Canadian Journal of Human Sexuality, 6*, 277–281.

Madoff, R. D. (2004). Chemoradiotherapy for rectal cancer—When, why, and how? *The New England Journal of Medicine, 351*, 1790–1792.

Manderson, L. (2005). Boundary breaches: The body, sex, and sexuality after stoma

surgery. *Social Science and Medicin*e, *61*, 405–415.

Marcus, S. M., Young, E. A., Kerber, K. B., Kornstein, S., Farabaugh, A. H., Mitchell, J., … Rush, A. J. (2005). Gender differences in depression: Findings from the STAR*D study. *Journal of Affective Disorders, 87*, 141–150.

Masters, W. H., & Johnson, V. E. (Eds.). (1966). *Human sexual response.* Boston: Little, Brown & Co.

McCarthy, B. W. (2004). An integrative cognitive-behavioral approach to understanding, assessing, and treating female sexual dysfunction. *Journal of Family Psychotherapy, 15*(3), 19–35.

McKinley, N. M. (2002). Feminist perspectives and objectified body consciousness. In T. F. Cash, & T. Pruzinsky (Eds.), *Body image: A handbook of theory, research, and clinical practice* (pp. 55–62). New York: The Guilford Press.

McLeish, A. (2004). Sexual function after rectal excision. *ANZ Journal of Surgery, 74*, 189.

Meeking, D. R., & Fosbury, J. A. (1998). Female sexual function and diabetes. *Practical Diabetes International, 15*, 165–166.

Meston, C. M. (2003). Validation of the Female Sexual Function Index (FSFI) in women with female orgasmic disorder and in women with hypoactive sexual desire disorder. *Journal of Sex and Marital Therapy, 29*, 39–46.

Meyers, L. S., Gamst, G., & Guarino, A. J. (2006). MANOVA: Comparing two groups. In L. S. Meyers, G. Gamst, & A. J. Guarino (Eds.), *Applied multivariate research:*

Design and interpretation (pp. 365–403). Thousand Oaks, CA: Sage Publication, Inc.

Miers, M. (2002). Developing an understanding of gender sensitive care: Exploring concepts and knowledge. *Journal of Advanced Nursing, 40,* 69–77.

Molassiotis, A., Chan, C. W. H., Yam, B. M. C., Chan, E. S. J., & Lam, C. S. W. (2002). Life after cancer: Adaptation issues faced by Chinese gynecological cancer survivors in Hong Kong. *Psycho-Oncology, 11*, 114–123.

Morley, J. E., & Tariq, S. H. (2003). Sexuality and disease. *Clinics in Geriatric Medicine, 19,* 563–573.

Moorey, S., Greer, S., Watson, M., Gorman, C., Rowden, L., Tunmore, R., … Bliss, J. (1991). The factor structure and factor stability of the Hospital Anxiety and Depression Scale in patients with cancer. *The British Journal of Psychiatry, 158,* 255–259.

Munday, A. R. (1982). An anatomical explanation for bladder dysfunction following rectal, uterine surgery. *British Journal of Urology, 54*, 501–504.

Munro, B. H. (2005). Regression. In B. H. Munro (Ed.), *Statistical methods for health care research* (pp. 259–286). Philadelphia, PA: Lippincott Williams & Wilkins.

National Cancer Institute. (n.d.). Estimated new cancer cases and deaths for 2009. Retrieved October 27, 2009, from http://seer.cancer.gov/csr/1975_2006/ results_single/sect_01_table.01.pdf.

National Cancer Institute. (n.d.). SEER Cancer Statistics Review 1975–2006. Retrieved February 19, 2010, from http://seer.cancer.gov/csr/1975_2006/results_merged/topic_survival.pdf.

Oakley, A. (Ed.). (1972). *Sex, gender, and society*. London: Maurice Temple Smith.

Ottesen, B., & Fahrenkrug, J. (1995). Vasoactive intestinal polypeptide and other preprovasoactive intestinal polypeptide-derived peptides in the female and male genital tract: Localisation, biosynthesis, and functional and clinical significance. *American Journal of Obstetrics and Gynecology, 172*, 1615–1631.

Park, K., Goldstein, I., Andry, C., Siroky, M. B., Krane, R. J., & Azadzoi, K. M. (1997). Vasculogenic female sexual dysfunction: The hemodynamic basis for vaginal engorgement insufficiency and clitoral erectile insufficiency. *International Journal of Impotence Research, 9*, 27–37.

Patel, D., Sharpe, L., Thewes, T., Bell, M. L., & Clarke, S. (2011). Using the distress thermometer and Hospital Anxiety and Depression Scale to screen for psychosocial morbidity in patients diagnosed with colorectal cancer. *Journal of Affective Disorder, 131*, 412–416.

Pelusi, J. (2006). Sexuality and body image. *Cancer Nursing, 29*, 32–38.

Perlman, S. D., & Abramson, P. R. (1982). Sexual satisfaction among married and cohabiting individuals. *Journal of Consulting and Clinical Psychology, 50*, 458–460.

Peterson, Z. D., Rothenberg, J. M., Bilbrey, S., & Heiman, J. R. (2010). Sexual functioning following elective hysterectomy: The role of surgical and

psychosocial variables. *Journal of Sex Research, 47*, 513–527.

Philippsohn, S., & Hartmann, U. (2009). Determinants of sexual satisfaction in a sample of German women. *The Journal of Sexual Medicine, 6*, 1001–1010.

Phipps, E., Braitman, L. E., Stites, S., & Leighton, J. C. (2008). Quality of life and symptom attribution in long-term colon cancer survivors. *Journal of Evaluation in Clinical Practice, 14*, 254–258.

Platell, C. F. E., Thompson, P. J., & Makin, G. B. (2004). Sexual health in women following pelvic surgery for rectal cancer. *British Journal of Surgery, 91*, 465–468.

Polit, D. F., & Beck, C. T. (Eds.). (2008). *Nursing research: Generating and assessing evidence for nursing practice*. Philadelphia, PA: Lippincott Williams & Wilkins.

Pujols, T., Meston, C., & Seal, B. N. (2010). The association between *sexual* satisfaction and *body image* in women. *Journal of Sexual Medicine, 7*, 905–916.

Pulerwitz, J., Gortmaker, S. L., & DeJong, W. (2000). Measuring sexual relationship power in HIV/STD research. *Sexual Roles, 42*, 637–660.

Pulerwitz, J., Amaro, H., DeJong, W., Gortmaker, S. L., & Rudd, R. (2002). Relationship power, condom use and HIV risk among women in the USA. *AIDS care, 14*, 789–800.

Purnine, D. M., & Carey, M. P. (1997). Interpersonal communication and sexual adjustment: The roles of understanding and agreement. *Journal of Consulting and Clinical Psychology, 65*, 1017–1025.

Raina, R., Pahlajani, G., Khan, S., Gupta, S., Agarwal, A., & Zippe, C. D. (2007). Female sexual dysfunction: Classification, pathophysiology, and management. *Fertility and Sterility, 88,* 1273–1284.

Rako, S. (2000). Testosterone supplemental therapy after hysterectomy with or without concomitant oophorectomy: Estrogen alone is not enough. *Journal of Women's Health and Gender-Based Medicine, 9,* 917–923.

Rasmusson, E-M., & Thome, B. (2008). Women's wishes and need for knowledge concerning sexuality and relationships in connection with gynecological cancer disease. *Sexuality and Disability, 26,* 207–218.

Ratliff, C. R., Gershenson, D. M., Morris, M., Burke, T. W., Levenback, C. L., Schover, L. R., … Wharton, J. T. (1996). Sexual adjustment of patients undergoing gracilis myocutaneous with pelvic exenteration. *Cancer, 78,* 2229–2235.

Rauch, P., Miny, J., Conroy, T., Neyton, L., & Guillemin, F. (2004). Quality of life among disease-free survivors of rectal cancer. *Journal of Clinical Oncology, 22,* 354–360.

Reissing, E. D., Laliberte, G. M., & Davis, H. J. (2005). Young women's sexual adjustment: The role of sexual self-schema, sexual self-efficacy, sexual aversion and body attitudes. *The Canadian Journal of Human Sexuality, 14*(3–4), 77–85.

Rich, T. A., Skibber, J. M., Ajani, J. A., Buchholz, D. J., Cleary, K. R., Dubrow, R. A., … Ota, D. W. (1995). Preoperative infusional chemoradiation therapy for stage T3 rectal cancer. *International Journal of Radiation Oncology, Biology, Physics. 32,* 1025–1029.

Rich, A. (1980). Compulsory heterosexuality and lesbian existence. *Signs, 5*, 631–660.

Rodgers, B. L. (2005). Feminism and science. In B. L. Rodgers (Ed.), *Developing nursing knowledge: Philosophical traditions and influences* (pp. 161–172). Philadelphia, PA: Lippincott Williams & Wilkins.

Romans, S. E., Tyas, J., Cohen, M. M., & Silverstone, T. (2007). Gender differences in the symptoms of major depressive disorder. *The Journal of Nervous and Mental Disease, 195*, 905–911.

Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, R., … D'Agostino, R. (2000). The female sexual function index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex and Marital Therapy, 26*, 191–208.

Ross, L., Abild-Nielsen, A. G., Thomsen, B. L., Karlsen, R. V., Boesen, E. H., & Johansen, C. (2007). Quality of life of Danish colorectal cancer patients with and without a stoma. *Support Care Cancer, 15*, 505–513.

Sacerdoti, R. C., Lagana, L., & Koopman, C. (2010). Altered sexual and body image after gynecological cancer treatment: How can psychologists help? *Professional Psychology: Research and Practice, 41*, 533–540.

Salonia, A., Munarriz, R. M., Naspro, R., Nappi, R. E., Briganti, A., Chionna, R., … Montorsi, F. (2004). Women's sexual dysfunction: A pathophysiological review. *BJU International, 93*(8), 1156–1164.

Salonia, A., Brigand, A., Deho, F., Zanni, G., Rigatti, P., & Montorsi, F. (2006). Women's sexual dysfunction: A review of the "surgical landscape." *European Urology, 50*(1), 44–52.

Sauers, D. D. (1993). An examination of various dimensions of life satisfaction in relationship to menopausal symptomatology and hormonal replacement therapy (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9318526).

Savard, J., Laberge, B., Gauthier, J. G., Ivers, H., & Bergeron, M. G. (1998). Evaluating anxiety and depression in HIV-infected patients. *Journal of Personality Assessment, 71*, 349–367.

Schmidt, C. E., Bestmann, B., Kuchler, T., & Kremer, B. (2005). Factors influencing sexual function in patients with rectal cancer. *International Journal of Impotence Research, 17*, 231–238.

Schmidt, C. E., Bestmann, B., Kuchler, T., Longo, W. E., & Kremer, B. (2005a). Ten-year historic cohort of quality of life and sexuality in patients with rectal cancer. *Diseases of the Colon and Rectum, 48*, 483–492.

Schmidt, C. E., Bestmann, B., Kuchler, T., Longo, W. E., & Kremer, B. (2005b). Prospective evaluation of quality of life of patients receiving either abdominoperineal resection or sphincter-preserving procedure for rectal cancer. *Annals of Surgical Oncology, 12*, 117–123.

Schneider, M. A., Brotherton, P. L., & Hailes, J. (1977). The effects of exogenous estrogens on depression in menopausal women. *The Medical Journal of Australia,*

2, 162–163.

Schover, L. R. (2005). Sexuality and fertility after cancer. *Hematology,* 523–527.

Schover, L. R., Fife, M., & Gerhenson, D. M. (1989). Sexual dysfunction and treatment for early stage cervical cancer. *Cancer, 63,* 204–212.

Sevin, B. U., & Koechli, O. R. (2001). Pelvic exenteration. *The Surgical Clinics of North America, 81,* 771–779.

Shell, J. A., Carolan, M., Zhang, Y., & Meneses, K. D. (2008). The longitudinal effects of cancer treatment on sexuality in individuals with lung cancer. *Oncology Nursing Forum, 35*(1), 73–79.

Sherwin, B. B., & Gelfand, M. M. (1985). Differential symptom response to parental estrogen and/or androgen administration in the surgical menopause. *American Journal of Obstetrics and Gynecology, 151,* 153–160.

Shulman, A. K. (1980). Sex and power: Sexual bases of radical feminism. *Signs, 5*, 590–604.

Sideris, L., Zenasni, F., Vernerey, D., Dauchy, S., Lasser, P., Pignon, J. P., … Pocard, M. (2005). Quality of life of patients operated on for low rectal cancer: Impact of the type of surgery and patients' characteristics. *Disease of the Colon and Rectum, 48*, 2180–2191.

Sigsworth, J. (1995). Feminist research: Its relevance to nursing. *Journal of Advanced Nursing, 22*, 896–899.

Snaith, R. P., Baugh, S. J., Clayden, A. D., Hussain, A., & Sipple, M. (1982). The Clinical Anxiety Scale: A modification of the Hamilton Anxiety Scale. *British*

Journal of Psychiatry, 141, 518–523.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology, 13*, 290–312.

Soet, J. E., Dudley, W. N., & Dilorio, C. (1999). The effects of ethnicity and perceived power on women's sexual behavior. *Psychology of Women Quarterly, 23*, 707–723.

Soper, D. S. (2011). Sobel test calculator for the significance of mediation [Online Software]. Available from http://www.danielsoper.com/statcalc3

Sprecher, S. (2002). Sexual satisfaction in premarital relationships: Associations with satisfaction, love, commitment, and stability. *Journal of Sex Research, 39*, 190–196.

Sprunk, E., & Alteneder, R. R. (2000). The impact of an ostomy on sexuality. *Clinical Journal of Oncology Nursing, 4*, 85–90.

Stevens, J. P. (2009). *Applied multivariate statistics for the social sciences*. New York: Routledge.

Suzuki, N., Ninomiya, M., Maruta, S., Hosonuma, S., Nishigaya, Y., Kobayashi, Y., … Ishizuka, B. (2011). Psychological characteristics of Japanese gynecologic cancer patients after learning the diagnosis according to the Hospital Anxiety and Depression Scale. *The Journal of Obstetrics and Gynaecology Research, 37*, 800–808.

Tang, C. S.-K., Siu, B.-N., Lai, F. D.-M., & Chung T. K. H. (1996). Heterosexual Chinese women's sexual adjustment after gynecological cancer. *Journal of Sex Research, 33*, 189–195.

Tang, C. S.-K., Lai, B. P. Y., & Chung, T. K. H. (2010). Influences of mastery, spousal support, and adaptive coping on sexual drive and satisfaction among Chinese gynecologic cancer survivors. *Archives of Sexual Behavior, 39*, 1191–1200.

Tekkis, P. P., Cornish, J. A., Remzi, F. H., Tilney, H. S., Strong, S. A., Church, J. M., … Fazio, V. W. (2009). Measuring sexual and urinary outcomes in women after rectal cancer excision. *Diseases of the Colon and Rectum, 52*(1), 46–54.

Thaler-DeMers, D. (2001). Intimacy issues: Sexuality, fertility, and relationships. *Seminars in Oncology Nursing, 17*, 255–262.

Thompson, A. L. (2007). *Close relationships among young adult survivors of childhood cancer: A quantitative and qualitative analysis*. Unpublished doctoral dissertation, University of Pittsburgh, Pittsburgh.

Thranov, I., & Klee, M. (1994). Sexually among gynecological cancer patients: A cross-sectional study. *Gynecology Oncology, 52*(1), 14–19.

Tierney, D. K. (2008). Sexuality: A quality-of-life issue for cancer survivors. *Seminars in Oncology Nursing, 24*, 71–79.

Tong, R. (Ed.). (1989). *Feminist thought: A comprehensive introduction*. Boulder, CO: Westview Press.

Trapnell, P. D., Meston, C. M., & Gorzalka, B. B. (1997). Spectatoring and the relationship between body image and sexual experience: Self-focus or self-

valence? *The Journal of Sex Research, 34*, 267–278.

Tyrer, G., Steel, J. M., Ewing, D. J., Bancroft, J., Warner, P., & Clarke, B. F. (1983). Sexual responsiveness in diabetic women. *Diabetologia, 24*, 166–171.

Vardi, Y. (2006). Female sexual dysfunction after pelvic surgery: Is there a place for nerve-sparing surgery? *European Urology, 50*, 14–16.

Vironen, J. H., Kairaluoma, M., Aalto, A. M., & Kellokumpu, I. H. (2006). Impact of functional results on quality of life after rectal cancer surgery. *Diseases of the Colon and Rectum, 49*(5), 568–578.

Vistad, I., Fossa, S. D., & Dahl, A. A. (2006). A critical review of patient-rated quality of life studies of long-term survivors of cervical cancer. *Gynecologic Oncology, 102*, 563–572.

Walmyr Publishing Co. (1997). *The Walmyr assessment scales scoring manual*. Tallahassee, FL: W. W. Hudson.

Walsh, K. E., & Berman, J. R. (2004). Sexual dysfunction in the older woman: An overview of the current understanding and management. *Drugs and Aging, 21*, 655–675.

Whisman, M. A., & Jacobson, N. S. (1990). Power, marital satisfaction, and response to marital therapy. *Journal of Family Psychology, 4*, 202–212.

White, C. A. (2000). Body image dimensions and cancer: A heuristic cognitive behavioral model. *Psycho-Oncology, 9*, 183–192.

Wiederman, M. W. (2002). Body image and sexual functioning. In T. Pruzinsky & T. F. Cash (Eds.), *Body image: A handbook of theory, research, and clinical practice* (pp. 287–294). New York: Guilford Press.

Wiederman, M. W., & Hurst, S. R. (1997). Physical attractiveness, body image, and women's sexual self-schema. *Psychology of Women Quarterly, 21*, 567–580.

Wiegel, M., Meston, C., & Rosen, R. (2005). The Female Sexual Function Index (FSFI): Cross-validation and development of clinical cutoff score. *Journal of Sex and Marital Therapy, 31*, 1–20.

Williams, J. B. W., Spitzer, R. L., Linzer, M., Kroenke, K., Hahn, S. R., deGruy, F. V., & Lazev, A. (1995). Gender differences in depression in primary care. *American Journal of Obstetrics and Gynecology, 173*, 654–659.

Wilmoth, M. C. (2001). The aftermath of breast cancer: An altered sexual self. *Cancer Nursing, 24*, 278–286.

Wilmoth, M. C., & Spinelli, A. (2000). Sexual implications of gynecologic cancer treatments. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 29*, 413–421.

Wing, J. K., Cooper, J. E., & Sartorius, N. (1974). *The measurement and classification of psychiatric symptoms*. London: Cambridge University Press.

Wingood, G., & DiClemente, R. (1998). Partner influences and gender-related factors associated with noncondom use among young adult African-American women. *American Journal of Community Psychology, 26*, 29–51.

Wood, J. M., Koch, P. B., & Mansfield, P. K. (2006). Women's sexual desire: A feminist

critique. *Journal of Sex Research, 43*, 236–244.

Yeh, H.-C., Lorenz, F. O., & Wickrama, K. A. S. (2006). Relationships among sexual satisfaction, marital quality, and marital instability at midlife. *Journal of Family Psychology, 20*, 339–343.

Yoder, J. D., & Kahn, A. S. (1992). Toward a feminist understanding of women and power. *Psychology of Women Quarterly, 16*, 381–388.

Yurek, D., Farrar, W., & Andersen, B. L. (2000). Breast cancer surgery: Comparing surgical groups and determining individual differences in postoperative sexuality and body image stress. *Journal of Consulting and Clinical Psychology, 68*, 697–709.

Zabora, J., Brintzenhofeszoc, K., Curbow, B., Hooker, C., & Piantadosi, S. (2001). The prevalence of psychological distress by cancer site. *Psycho-Oncology, 10*(1), 19–28.

Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Et Neurologica Scandinavica*, *67*, 361–370.

Zippe, C., Nandipati, K., Agarwal, A., & Raina, R. (2006). Sexual dysfunction after pelvic surgery. *International Journal of Impotence Research, 18*(1), 1–18.

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